# COAL AGE

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A few years ago an ingenious advertising man popularized a poster that pictured a large hand with the fore-finger pointing straight at the passerby and underneath, in flaming red letters, was the word *YOU*.

It was so designed that no matter from what angle you viewed it, the finger seemed always to point at you.

This man realized that the average human being is prone to accept any statement as true, so long as it affects mankind in general, but if you hope to make the human being in question realize that you are talking to *him*, and for *him*, you must stop him long enough to get his mind off mankind in general.

If, after pondering over this statement for a moment, you are inclined to agree with it, you'll be in position to understand why it is that so much of the welfare work carried on around our mining camps seems to bear so little fruit.

Take the "safety first" campaign as an illustration: Just now it generally begins (and very often ends) with placards. Now a large part of the placards used are so worded that no one can dispute the truth of the statements and yet they fail to make each man realize that the message is intended primarily for *him*.

If we hark back to the old, old proverb that tells us to remember that a chain is no stronger than its weakest link, the necessity of the personal note as suggested by the advertising man's pointing fore-finger becomes apparent.

For example, *Mr. Superintendent*, you're one of the links! The next time you are inside the mine and decide that you will ride the haulage trip out, to save time, even though none of your men are allowed to ride, under penalty of discharge; think of that invisible but fearfully real finger pointing at *you* from a "Safety first" placard.

*Mr. Mine Foreman*, you're one of the links! When you are tempted to urge your motormen to make up time they have lost, even though it be contrary to speed rules; think of that haunting finger pointing at you.

*Mr. Fireboss*, you're one of the links! The next time you skip a room on your rounds, just because you are tired and know that it is safe; think of that ominous finger pointing your way.

*Mr. Trackman*, you're also one of the links! When you put two spikes in a rail that requires five, just because you are out of spikes and don't feel like going after more; think of that tell-tale finger pointing at you.

No need to get personal with you, *Mr. Miner*: every one knows that you must be careful and every one tells you so. Perhaps, however, if some of the bosses acted as if they understood, you might manifest interest enough to inquire from your neighbor as to just what all the fuss was about.

We are not attempting to take sides with the miner; we are simply trying to follow the example set by the advertising man—we want to get you, Mr. Superintendent and Mr. Mine Foreman and Mr. Fireboss and Mr. Trackman and Mr. every other man, into an argument with your thoughtless self.

Ralph Waldo Emerson, who knew a few things about human nature, *partially* covered the ground when he said: "If you would lift me, you must be on higher ground." We say partially because this isn't a case of lifting me; it's something far more difficult; its a case of lifting *you*.

MORAL: Don't forget that you and I and every other body must realize our individual responsibility if we would be linked in a chain of safety.

# Scientific Principles in Use of Dynamite

SPECIAL CORRESPONDENCE

*SYNOPSIS—The use of explosives has been scientifically considered but no one seems desirous of using the results of the determinations. The writer shows that safety and efficiency both depend on the methods employed in the use of dynamite. The action of the detonator should be directed toward the main body of the charge and so arranged that the maximum shock will be at the end of the hole.*

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It is said that there is a right and a wrong way of performing even the most ordinary and commonplace act, and it is interesting to note that the unerring instinct of so many is to do it the wrong way, especially those people who "know it all." Any user of dynamite and every blaster will tell you that he knows all about dynamite and has been shooting holes ever since dynamite was invented, and some of them claim to have blasted with dynamite even before that time.

It is no exaggeration to say that there is hardly a line of manufactured articles which is used with such

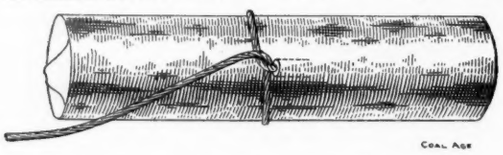



FIG. 1. A METHOD OF PRIMING BY WHICH SHORT-CIRCUITS AND MISFIRES RESULT. AVOID HALF HITCHES

utter disregard of the manufacturer's directions as high explosives. Manufacturers print directions, which are placed in every box of dynamite; they distribute thousands of booklets and catalogs and issue carloads of warning cards of various descriptions indicating how their goods should be used. Notwithstanding all this, there is probably not more than one consumer in five hundred who thinks it necessary or desirable to follow these directions. He considers himself an expert on the subject and knows more than the manufacturer about the product.

There are two requisites which consumers fail to observe, and because of their neglect they get lessened efficiency from the dynamite; (1) they do not thaw the explosive correctly and (2) they fail to make the primer in the proper manner. The question of thawing will not be dealt with in this article. Correct priming involves two precautions: correctly locating the connecting medium, that is, fuse or electric fuse wire, and placing the detonator in the proper position in relation to the charge.

### BEWARE OF SHARP BENDS IN THE ELECTRIC FUSE

Taking up electric blasting first, 99 out of 100 blasters insert the electric fuse in the side of the dynamite cartridge and take a half hitch with the wires around the cartridge, giving them a smart pull to tighten them, as in Fig. 1.

Of those who do not use this method, 99 out of 100 insert the detonator in the end of the dynamite cartridge, double it over, and stick the cartridge exploder end first into the borehole. The trouble with the half-hitch method is that it is liable to cause misfires by a short circuit, where the wires are pulled against each other at the hitch. Of course, if the current goes across this point, it will not fire the detonator.

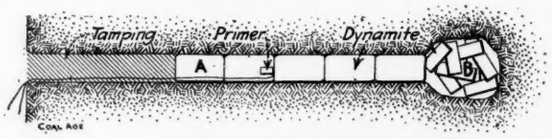



FIG. 2. WRONG METHOD OF PRIMING, GIVING GREATEST INTENSITY OF DETONATION NEAR THE TAMPING

The detonator when stuck in the end of the cartridge and pointing out toward the mouth of the borehole, does not realize the full power of the explosive for the reason that the direction of the greatest detonating force of an electric fuse or blasting cap is out of the "business end,"

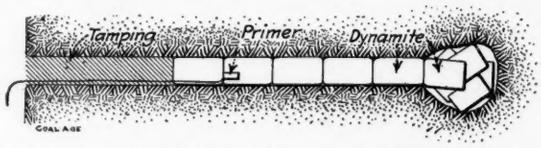



FIG. 3. A WELL PLANNED SHOT. THE "BUSINESS END" OF THE PRIMER FACES LARGER PART OF CHARGE

that is the opposite end from that into which the fuse is put or from which the fuse wires protrude.

### THE DETONATOR SHOULD HAVE THE OPEN END FACING THE BULK OF THE CHARGE

When the primer is placed, as shown in Fig. 2, the dynamite at the point indicated by *A* gets the maximum strength of the explosion, and in actual practice it has been found that there is a liability of unexploded powder being found at *B*.

Fig. 3 shows the proper way of placing the detonator where only one is used in each hole.

Fig. 4 shows even a better method with two detonators,

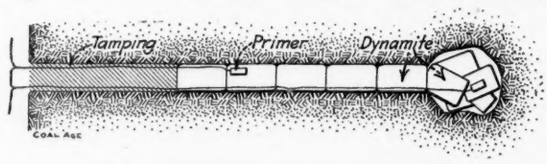



FIG. 4. A WELL ARRANGED SHOT WITH TWO CENTERS OF DETONATION AND WITH PRIMERS RIGHTLY LOCATED

one set not far from the tamping in the second cartridge and the other running to a cartridge in the end of the hole. Practically every particle of strength of the explosive is used and there is almost no chance for a misfire or of having unexploded dynamite in the débris.

### AVOID THE POSSIBILITY OF STRIKING THE CARTRIDGE WITH TAMPER

The few blasters who do not use either of the two methods of priming condemned above, open up one end

The shots here illustrated are for the most part arranged for vertical holes, as frequently appears in the text. In many cases, it will be seen that the holes, being in soft material, have been enlarged at the ends by untamped shots. The principles enuntiated apply equally to all forms of dynamite shooting.—Editor.

of the paper wrapper and stick the blasting cap or electric fuse in the end and either tie or crimp the paper down to hold the detonator in place. Once this is loaded in the hole, it makes an ideal blast, as the detonator is in the center of the borehole and pointed towards the end. It has the disadvantages, however, of bending the fuse wire or fuse sharply when the tamping stick is pushed against it and of bringing the detonator itself nearly in contact with the tamping stick, and on this account is a little less safe than the method whereby the detonator is placed in the middle of the cartridge, as shown in Fig. 5.

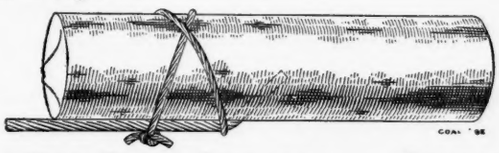


FIG. 5. TYING FUSE BY LOOP AROUND THE PERIPHERY OF THE CARTRIDGE KEEPS IT SECURELY IN PLACE

The fuse or fuse wires may be tied with a string to the cartridge, or the fuse wires may be laced through the cartridge (see Fig. 6), thus avoiding the wires crossing and so making a short circuit.

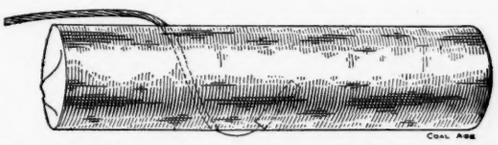


FIG. 6. A METHOD OF ARRANGING ELECTRIC FUSE WIRES SO THAT THERE IS NO RISK OF A SHORT-CIRCUIT

### COMMON FUSE SHOULD BE RUN TO LAST CARTRIDGE, ELECTRIC FUSE TO LAST BUT ONE

Fuse, of course, should not be laced through dynamite cartridges, as it is liable to ignite them from its side spit, and for the same reason, charges fired with blasting cap and fuse should have the primer in the last cartridge loaded in the hole, especially in charges where the cartridges are slit or taken out of their paper wrappers. With electric exploders it is usually best to allow one cartridge to be above the primer, i.e., have the primer next to the last cartridge loaded in the hole so that in case of a misfire, if the tamping is to be removed, there

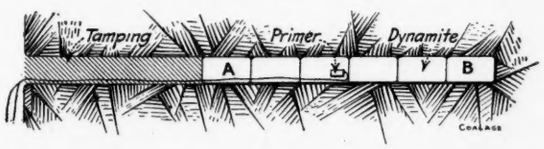



FIG. 7. PRIMER WITH ITS "BUSINESS END" FACING *A*, WILL DETONATE MORE VIOLENTLY THERE THAN AT *B*

is one cartridge between the tamping and the primer, which is the most dangerous point in the charge.

There are two reasons why better execution is obtained from the priming method shown in Fig. 3, than from that exemplified in Fig. 2. One reason is that the maximum effect of the detonator is at its "business end" in a hole loaded as shown thus.

With the primer in the middle (see Fig. 7) and an equal amount of dynamite at each end, the charge at *A* would explode with greater force than that at *B*, where it is most desired. With very sensitive explosives and those most dangerous to handle, this difference in the effect of the direction of the detonator would not be as noticeable as with more insensitive explosives, such as the gelatines and ammonia powders.

### DYNAMITE DETONATION GAINS SPEED WITH TRAVEL UP TO A CERTAIN LIMIT

In a hole loaded like this, you will not get as much work out of the dynamite as if the primer were placed as in Fig. 3, because the power of an explosive depends on two things—the volume of gas liberated and the quickness with which this is done. It takes a certain well-defined distance in the dynamite for its detonation to pick up its full speed, just as it takes a certain time for a railroad train to get under way.

It takes about a foot, sometimes more for modern, safe, insensitive dynamites to reach their maximum speed of propagation. This is not theory; it has been positively and accurately determined by firing charges with different explosives in a tube, through which wires are passed at intervals, which are connected electrically with an instrument called a chronograph. In this way, it has been determined that a detonating wave will travel

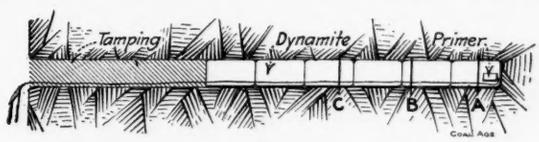



FIG. 8. A GOOD SHOT WIRED TO SHOW THAT DETONATION TIME IS SHORTER FROM *B* TO *C* THAN FROM *A* TO *B*

through dynamite quite slowly, comparatively speaking, for the first 6 or 8 in., and about a foot from the place where the detonator was located it acquires its full velocity and goes on at that speed for the rest of the distance.

It has been often observed in firing horizontal shots in a comparatively shallow hole, say 10 or 12 in. deep, that after the blast the rock shows a perfectly smooth surface up at the top, where the detonator was located, and for 6 in. from that point, but after that and at the bottom of the hole, the rock is burned and shattered. In Fig. 8 if wires are placed across the charge at equal distances at the points indicated by *A*, *B* and *C*, it will be found that it takes much longer for wire *B* to break after *A* has broken than it does for *C* to break after *B* has broken.

This point has been proven on a large scale in practical quarry work by priming half the holes in a uniform ledge of 28 holes as shown in Fig. 2—the detonator being at the top and pointing towards the mouth of the hole. The other holes were loaded as shown in Fig. 3, with the detonator at the top and pointing toward the bulk of the charge. The ledge in which the detonator pointed outward was thrown off to within 2 ft. of the bottom of the hole. There the rock was broken in places but was not thrown out. In the other half of the ledge where the detonator pointed towards the bulk of the charge, the rock was thrown off clear and clean and nearly 2 ft. below the bottom line of the hole, taking off about 30 per cent. more material than the same charge did with the detonator pointed the wrong way.

# Naphthalene as a Briquette Binder

*SYNOPSIS—Exhaustive experiments have been conducted by both the government and private individuals in the effort to obtain a substitute for pitch as a binder in briquetting. These have, in the main, been unproductive of results. The accompanying article describes the use of naphthalene for this purpose and it is said to give satisfaction when used as a partial substitute.*

A new method of mixing naphthalene with briquettes as a substance for part of the pitch binder is described in *Glückhauf,* Essen, Germany, Sept. 21, and Oct. 26, 1912, by Mine Assessor Grahn, instructor at the Bochum Mining School. We translate in abstract as follows:

The binder generally used for briquetting coal is pitch, the price of which is therefore an important consideration. It is quite an expensive binder and if, at a cost of $10 per ton, 7 per cent. by weight is added to the briquettes, this means an item of 70c. per ton of the product. Search has been made for a cheaper substance with which to replace some at least of the pitch. An important material for this purpose is naphthalene.

### The Buss-Fohr System

There has been introduced in Germany the Buss-Fohr patent system for briquetting coal, lignite, peat, etc., using superheated steam and naphthalene. This apparatus is successfully operated in Kray, Germany, at the Bonifacius mine of the Gelsengirchener Bergswerks-A. G.; it is shown in the accompanying figures.

Crude naphthalene is first led into an iron pressure tank in the briquette factory cellar and there melted by steam. It is then forced, by compressed air, through a sieve filter, and into a reservoir above the mixer, the reservoir being likewise heated by steam coils. Formerly the naphthalene simply flowed from this reservoir into the mixer, but it was found that on mixing with the fine coal it formed into lumps which adhered to the briquetting press.

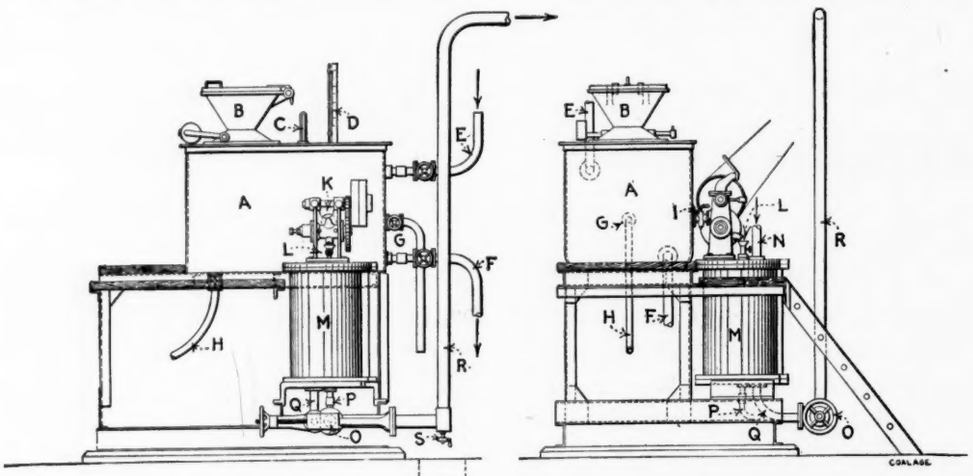
This difficulty has been remedied by introducing a spraying nozzle or injector in the top of the mixer. The liquid naphthalene is now blown by steam and thus distributed as evenly as possible upon the fine coal, which is kneaded by a stirring device in the mixer. Into the mixer is led superheated steam at about 660 deg. F., which keeps the temperature at about 480 deg. In contrast to the Schüring apparatus, to be described later, the naphthalene is not vaporized until it reaches the mixer.

### The Importance of Vaporizing.

It is important that all the naphthalene shall vaporize and be distributed in the gaseous state between the particles of coal. That it does effectually vaporize, and not remain in liquid form, is proved by the fact that when more steam is led into the mixer, or when same is at a considerably higher temperature than usual, naphalene in vapor form escapes above and precipitates outside of the mixer in white flakes. This visible deposit is a guide for regulating the temperature and quantity of steam supplied.

From the mixer, the pasty mass of fine coal, melted pitch and naphthalene is conveyed to the presses. At the Bonifacius mine two Tigler presses of new design are used for making large industrial briquettes weighing 22 lb. The average pitch consumption, without naphthalene, is 6 per cent. of the coal supplied, but this is reduced to 5 per cent. when replaced by about 2 per cent. of naphthalene. It is stated by the inventor, however, that the spray nozzle which has been mentioned, renders possible a further reduction in the pitch of about 1 per cent., for which is substituted 1 per cent. more of naphthalene. The results at the Bonifacius mine were attained in making briquettes of very fine coal of a sort requiring more pitch than some other kinds.

Briquettes, containing naphthalene, from this mine have proved satisfactory for marine use after more than two years storage. The manufacturers prefer the briquettes with naphthalene; they come from the press softer but harden on cooling.



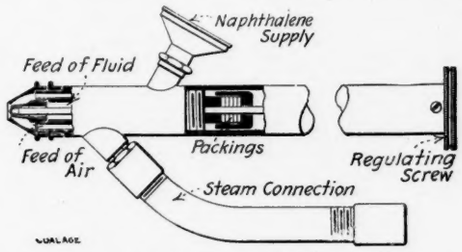

Schüring's Naphthalene Vaporizer for Briquetting

### Schuring System

Another process it that of Schüring, also patented in Germany. The naphthalene, melted outside of the mixer, is next vaporized in a carburetor heated by superheated

steam and afterward forced into the material by superheated steam in the mixer. The apparatus is illustrated in the accompanying figures.

The naphthalene is first fed through a hopper *B* into a pot *A*, where, by means of live steam from the superheater coil *E*, it is heated to about 212 deg. F. and so melted. The cocks *G* and *H* allow the melting pot to

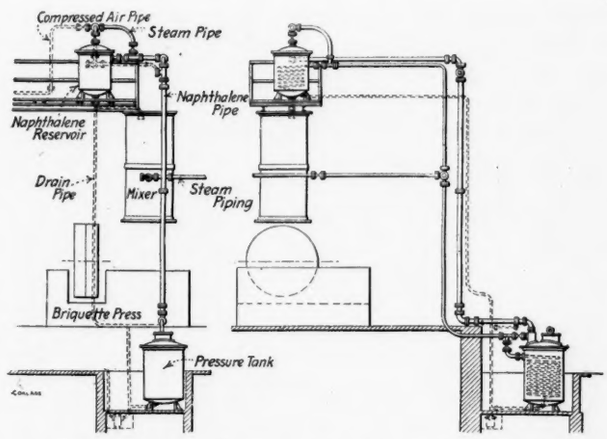



NOZZLE FOR SPRAYING NAPHTHALENE

be emptied of naphthalene and naphthalene sediment for cleaning. The condensed steam is led off through the pipe *F*.

In general, the melted naphthalene passes automatically through the outlet cock *I* into the measuring apparatus *K*, which is surrounded by a jacket that can be heated, and thence in definite quantities, through the feed funnel *L*, into the vaporizing coil in the heating cylinder *M*. Through the pipe *N*, superheated steam at perhaps 480 to 660 deg. F. enters the heating cylinder, surrounds the vaporizer coil and emerges through the pipe *Q* in order to serve the steam-jet apparatus or injector *O*.

The napthalene is vaporized in the heating cylinder and flows through the outlet connection *P* also to the injector *O*. Here the steam pressure should be at least four atmospheres absolute, with a temperature of 480 deg. The naphthalene, in a practically gaseous state, is blown through it and along the pipe *R* to the steam kneader or mixer. A drainage cock *S* permits the re-




FRONT AND SIDE VIEW OF BUSS-FOHR SYSTEM

moval of any condensed naphthalene that may have collected. It must always be opened when the entire apparatus ceases operation.

The thermometer *C* and a pyrometer are provided for observing the temperatures of melting pot and vaporizer respectively. A float gage *D* shows the level of the naphthalene in the melting pot.

### SOME PRACTICAL APPLICATIONS

The coal, together with the required proportion of the pitch binder, is heated in the ordinary manner. It is then well impregnated by passing the naphthalene and steam mixture through it from the bottom to top, yet so that no naphthalene vapor escapes at the upper end. The briquetting press is connected with the vapor mixer.

The Schüring system has been tried at the Blankenburg mine in the Dortmund Upper District. It was found there that by the addition of 3 per cent. naphthalene the percentage of pitch could be reduced from 6¼ or 6½ per cent. to 4½ or 5 per cent., while maintaining a satisfactory quality of the product; it was found impracticable to use over 3 per cent. naphthalene, as the briquettes stuck in the press and also showed less strength. The average quantity of pitch per ton of briquettes without naphthalene, as employed in the district, is said to be slightly larger than that at the Blankenburg mine, which will indicate a still greater possibility of saving.

While the percentages of saving in pitch, as here stated, are too rough and fragmentary for close comparisons, it is proper to point out a slight difference in the bases of computation, the percentage at the Bonifacius mine apparently being reckoned upon the weight of coal used and at the Blankenburg colliery upon the weight of briquettes produced.

## A Large Coal Bill

The coal bill of a big trans-Atlantic liner is sufficiently great under ordinary circumstances, but when strike conditions prevail, with consequent high prices, the sum paid for sufficient fuel for a single voyage may amount almost to a small fortune.

The White Star liner "Olympic" for her last trip to this country was compelled to pay $5 per ton for her bunker coal, and had difficulty in securing enough to supply her needs at even this price. Her total expense for coal alone upon this voyage was $25,000.

Upon this trip the vessel carried 1586 passengers of all classes, and the expense for fuel for each passenger amounted in round numbers to $15.70, and as the voyage was completed in 5 days, 18 hours and 46 min., the coal bill amounted to very slightly over $3 per minute.

In reckoning fuel costs, all figures should be regarded as relative. Because one steamer burns a greater weight or value of coal than another, does not necessarily signify that her freight cost per ton-mile is any higher. It is probable that other vessels plying between the same ports at about the same time as the Olympic were compelled to pay equal rates per ton in order to fill their bunkers. It is doubtful, however, if any other steamer paid such an enormous sum for fuel enough for a single voyage.

The advantages of electric mine lights, as compared with ordinary mine lights, are:

(1) The absence of oil permits tilting at any angle without injury to the light, thus affording a good illumination for the examination of roofs. (2) Regular and constant radiance. (3) Safety in explosive gas unless the bulb is broken. (4) Light not extinguished by the presenec of gas or by small blasts of air. (5) No loss of time from being accidentally extinguished. (7) Periodical examinations unnecessary. (8) No smoke. (9) No gauze being used, it cannot become heated by the tilting of the lamp with a consequent explosion of gas.

# Mine Explosions Caused by Gas Wells

By A. W. Hesse*

*SYNOPSIS—The writer shows that gas wells have been the cause of three severe explosions. The upward pressure of the gas at the coal may be greater than the downward pressure of the roof. It is easy, therefore, to see how leakage through crevices takes place. A mine separated from a well by 1500 ft. of unbroken strata caused a violent explosion in a mine just opened. A one-inch pipe inserted in the coal gave 17,600 cu.ft. of gas.*

On Nov. 21, 1912, an explosion occurred in a small country coal mine located about three miles west of Shinnston, W. Va. Two small boys were killed and the father was fatally burned while attempting to rescue them. Later examination showed the cause to be the escape of gas from a well located about three or four hundred feet away. This well had been drilled to the gas about 6 years previously and about 1910 it was cleaned out and tubed; after which a casing head was placed so as to enclose the gas within the outside casings. In all probability no packers were placed at the bottom of the hole to prevent leakage around the casings.

Attention has been called to Judge Doty's decision against the Penn. Gas Coal Co., which corporation sought to restrain the Greensboro Gas Co. from drilling a well through their coal without fulfilling a previous agreement to protect their operations.[1]

## Explosion at a Consolidation Mine

The explosion which occurred in two mines of The Consolidation Coal Co., in the Fairmount region in 1910, was proved to be directly caused by a capped gas well.[2]

This well was started with a 13-in. bit and drilled to a depth of about 246 ft., or about 82 ft. below the Pittsburgh coal seam. An 8¼-in. casing was then "run in" and a cement mixture poured around it, up to some point above the coal. The cover at this point is about 176 ft. thick. When the well reached the gas, a casing head was placed on the 8¼-in. casing. After standing for some time, the pressure reached about 850 lb. per sq.in.

## The Downward Pressure of the Measures Compared with the Upward Pressure of the Gas

According to investigations made at Lehigh University a vertical column of coal-measure rock, 176 ft. high and one foot square, will produce, approximately, a compression of 13.3 tons net or about 185 lb. per sq.in. The gas pressure of the aforementioned well was over four and a half times this amount, and as most of the coal in this neighborhood was extracted, the chances for the leaking of the gas were highly favorable.

In June of 1911, the Hutchinson Coal Co. made an opening into the Pittsburgh coal, about 8 miles west of Clarksburg, on the Parkersburg branch of the Baltimore & Ohio R.R. After the entries had advanced about 80 ft. a gas explosion blew mine cars and tools out of the opening. Upon investigation, the odor of natural gas could be easily detected and a 1-in pipe inserted into the coal showed a pressure of two-tenths inch water gage or a flow of about 17,600 cu.ft. of gas per day. It is easy to imagine how large a quantity of gas must have been escaping from the entire face of the entry.

## Explosion Caused by a Well 1500 Feet Away

A gas well about 450 ft. distant from this opening, and near the outcrop, was uncapped but this had no effect upon the flow of gas. Another well located about 1500 ft. south was then opened and the flow of gas immediately stopped. No indication of gas has since been found in this mine.

Any gas well of long standing may be considered a menace to coal operations, especially if the gas is confined in the outer casings. The reason follows, reference being made to the sands penetrated in this locality.

A well is drilled at the commencement with a 13- or 16-in. bit and goes to some point between the surface and the Dunkard Sand, depending on the location of water. Ten-inch casing is run in the hole to this depth; but no packer is placed on the bottom to prevent any possible escape of gas.

The hole may be drilled on down to the Big Lime and 8-in. casing run in to this point. It is probable that the driller will fail to place a packer on the bottom. The size of the bit and drill is then reduced and the hole extended down to the Big Injun Sand, where a sufficient quantity of gas to warrant immediate piping may be found. But we will suppose that a fair quantity is obtained. The 6-in. casing is immediately run in the hole and the packer placed in some rock just above the point where gas is found. This confines the gas to the 6-in. casing.

The driller continues down to the Thirty Foot, Fifty Foot, or the Fifth and Sixth Sands, depending on the gas indications and the location. Perhaps 5-in. casing is run in to some point below the Injun Sand to confine this gas between the 5- and 6-in. casings. Then if the flow of gas is not exceptional from the lower sand, 3-in tubing is run in to the gas-producing sand and the anchor packer placed in some solid rock above.

## If Packers Deteriorate, the Casings Cease to Protect

Should this well stand for a number of years, there is little doubt but that the rubber on the various packers may deteriorate to such an extent as to allow the escape of gas around the bottom of the casings to which the packers are attached. It is difficult to say just where this gas will appear—on the surface or in the mine.

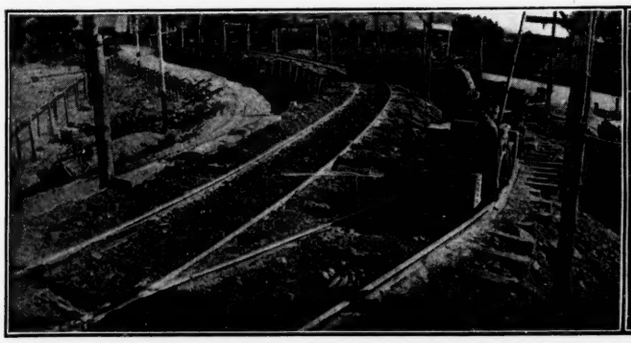
Therefore, a coal operator should know, and has the right to know, as much regarding the conditions and methods, of a well being drilled through the seam of coal he is working as the person, party or company drilling such a well. Otherwise, he is negligent and, unless he takes sufficient interest in his own property to call attention to these dangers, how can he expect the gas or oil man to care for his interests.

*Assistant chief engineer, Consolidation Coal Co., West Virginia division, Fairmont, W. Va.

[1] "Coal Trade Bulletin," Vol. XXVII, No. 6, Aug. 15, 1912.

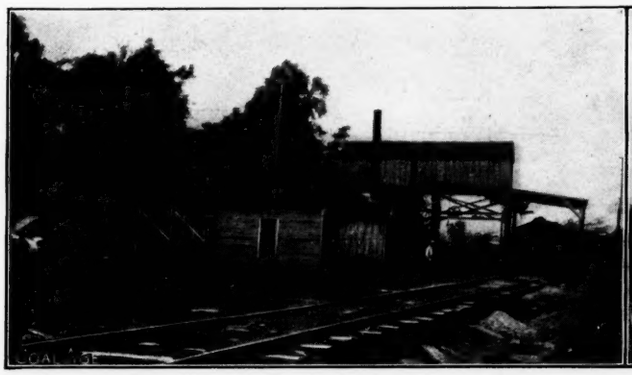
[2] "Mines and Minerals," Vol. XXXII, No. 1, August, 1911.

# SNAP SHOTS IN COAL MINING

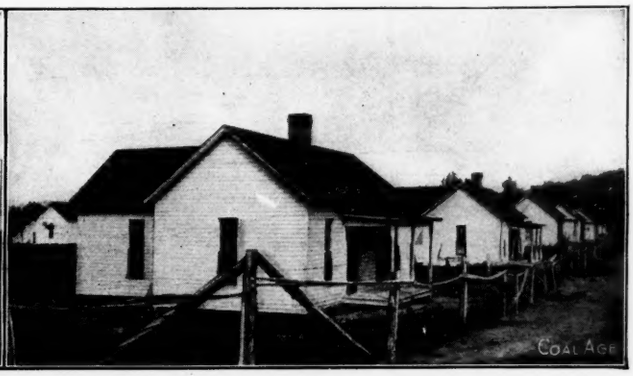


A 5-ton Motor Hauling Trip of Empties, Wyoming Coal Mining Co., Monarch, Wyo.

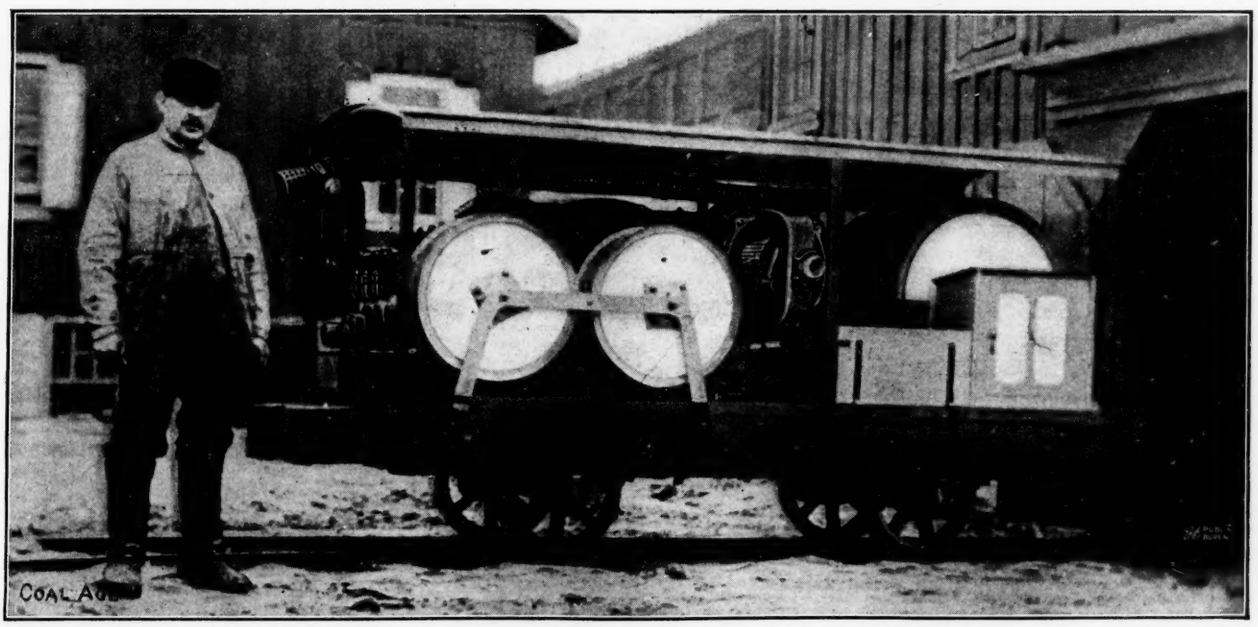
Tipple and Power House, Lansing Mine, the Lorain Coal & Dock Co., Lansing, Ohio.



Tipple at Mine of Forsythe Coal Co., Providence, Ky. Output 150 Tons per Day. Coal Shot from Solid



Miner's Houses, Kington Coal Co., White City, Ky. A Type of 3-room Miner's House Common in this Region



Portable Fire Outfit with a Triplex Pump, Driven by a General Electric Motor. Packer No. 5 Colliery, Lost Creek, Penn.

# Original Impurities of Bering Coals

By W. R. Crane*

*SYNOPSIS—Had the Bering field coals never been folded, faulted, pulverized, devolatilized and streaked with dikes and sills, they would still have been intensely interesting to economic geologists. Dr. Crane in this, the third of his series of papers, shows that the partings rise and wane incontinently, and that pyrite boulders are found of an abnormal size. Bituminous shale "horses" and "bells" of argillaceous material add to the risks of mining and to the difficulties experienced in preparing clean coal.*

The coals of the Bering River field occur in Tertiary rocks, as do many other coals in Alaska. The beds are given a number of local names, but the enumeration of these would be of no particular interest, and I therefore omit all reference to them.

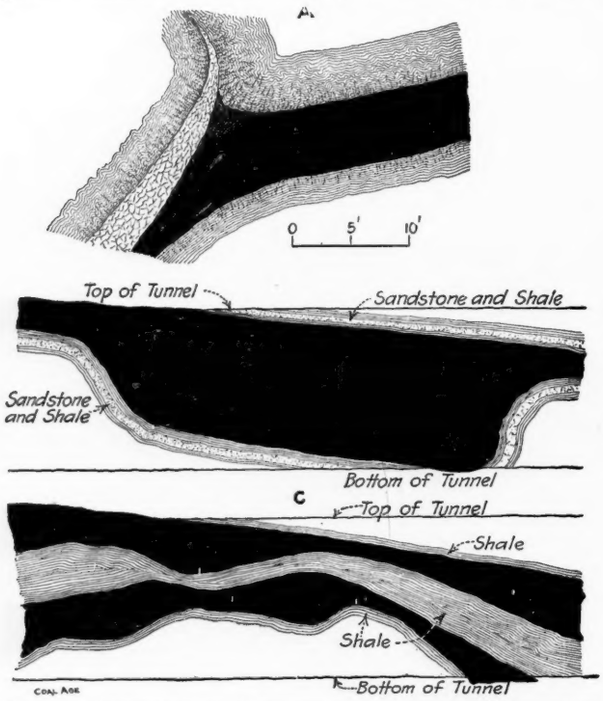



Fig. 1. Sections in Tunnel on Carbon Mountain, Showing Variations in Coal and Shale

### How Upheaval, Erosion, Subsidence, Folding, Intrusion and Glaciation Have Modified the Coal

The geological history of this region is one of many and diversified changes; it has been subjected to periods of upheaval, alternating with periods of inactivity, during which time erosion acted, cutting out valleys which, at present, are filled with alluvium. Later, subsidence brought the land to practically its present position. Folding and faulting, accompanied by intrusions of igneous materials in the form of dikes and sills, were probably subsequent actions.

Glaciers have played no small part in the production of the present topography of the region and further have left behind in their retreat vast accumulations of débris, which are still choking the rivers and bays with silt. Bering River, which would otherwise have been of great assistance in the opening up and development of the coal field has, by such accumulations, been rendered unnavigable to all vessels except canoes and rowboats.

The condition of the rock strata is an index of the condition and character of the coals found associated with them. The folding and faulting observed in this region and the occurrence of igneous intrusions as dikes and sills, are evidence of extensive rock movements, and the coal beds being soft and friable have been disturbed even in undue proportion to what might possibly be expected from the conditions of the rock formations.

The character of the coal both physically and chemically has also undergone marked changes, as the whole range from bituminous coal to anthracite is to be found in the limited area of this field. Reference has already been made on pages 212 and 298 to certain badly disturbed areas, and some sections were given showing the forms assumed.

Fig. 2. A Nodule of Pyrite Occurring Close to the Top Rock

The characters of the coal beds result from the conditions existing either (1) during formation or deposition, or (2) during subsequent periods. In this paper only the nature of the coal, as determined by the first conditions, will be discussed. In the first case may be considered such characters as, variations in thickness of deposit, occurrence of shale partings, nodules of shale, clay and pyrites, horses of shale (not clay veins) and bells, which occur in the deposits or extend into them from the top or bottom formations; in the second case, such occurrences as clay veins, igneous intrusions as dikes and sills, and a wide range of irregularities resulting from folding and faulting of the formations.

*Professor of mining, Pennsylvania State College, State College, Penn.

Occasionally it is found extremely difficult to explain the occurrence of an irregularity without considering both causes as contributing to its formation. There will be occasion to refer to one or more such occurrences in connection with this discussion.

### Interstratifications of Foreign Material

Probably the most common form of irregularity is the occurrence of foreign material interstratified with the coal. Few coals are free from such interstratifications or partings and those of this field are no exception to the rule. These partings, in some instances, vary greatly in thickness at points not far removed from each other, and they are often far from parallel with the coal beds. See Fig. 1. Further, both partings and coal may assume lenticular forms varying in width in a most surprising manner. Again a parting may become abnormally thick, assuming the form of a roll and wholly or in part pinching out the coal. It is not an easy matter to consider that such irregularities are produced alone by conditions affecting depositions of the coal and rock materials, but

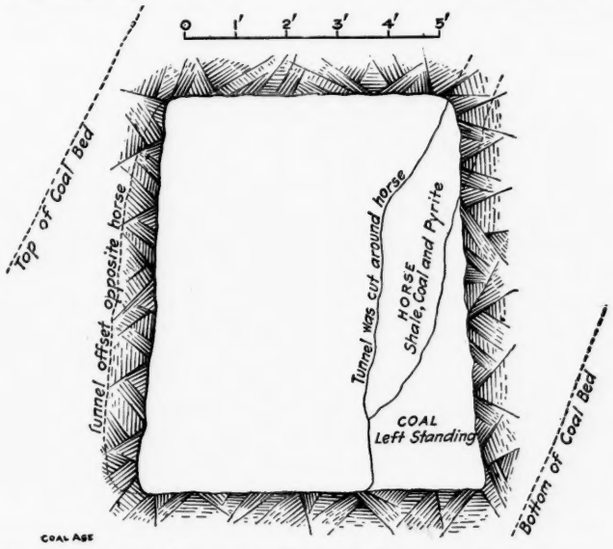



Fig. 3. Horse Next to Bottom Rock as Exposed in Tunnel, Showing How Latter Was Turned to Avoid Excavation of Waste Rock

when the lines of stratification conform with the irregularities, such a conclusion can hardly be denied. See Fig. 2, *B* and *C*.

### Pyrite Occurs in Phenomenal Masses

Considerable pyrite, regularly termed "sulphur," occurs in the coal beds of certain portions of the field. Such occurrences are locally known, as nigger heads; they are nodules, oval or disk-like in form, and they vary in size from a fraction of an inch to several feet in diameter. In fact, in certain coal beds masses lenticular in form, have been observed to extend for 6 or 8 ft., forming in reality horses. They usually follow close to the top or bottom of the bed, although occasionally they protrude into it. See Fig. 2.

These nodules, having no connection or bond with either the coal or rock, present an element of danger which, in many cases, is formidable. Further, nodules of moderate size are apt to fall from the faces and ribs of coal and do considerable damage. In any case, large or small, they must be separated from the coal, the difficulty of handling increasing with the size.

### Horses and Bells Make Mining Dangerous

Masses of clay and shale, so bituminous in character as to have every appearance of coal, not excepting the luster, are of frequent occurrence, often making an extremely treacherous top or even bad walls if the bed stands at a high angle, as is frequently the case. See Fig. 3. Aside from difficulties of support, much coal is often of necessity left around such masses or horses, the idea

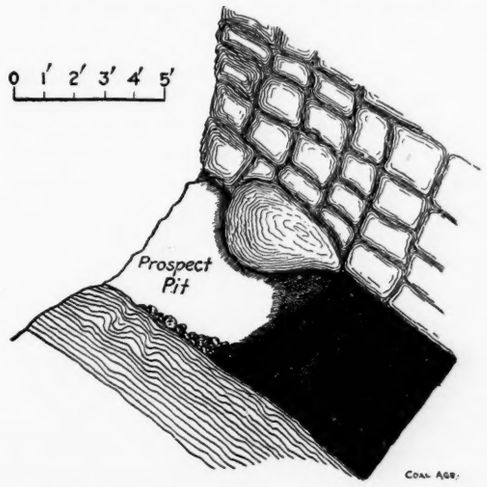



Fig. 4. Bell and Weathering of Shale Top Rock along Joint Planes

being to prevent their fall rather than go to the trouble and expense of removing them. Such irregularities are usually designated as "horses."

Large rounded masses of clay and shale occurring in the top formations of the coal beds and having practically no connection with them, are usually known as "bells." As a general rule they are of limited size, seldom exceeding 6 or 8 ft. in diameter, but occasionally they assume such proportions locally as to be in the nature of beds, and they may even pinch out the coal entirely. See Fig. 4.

## The Deepest Borehole in the World?

Near Czuchow, in Silesia, according to *The Mining Journal,* a borehole has been sunk to a depth of 7349 ft., the time required for its completion being 982 days. The first 174 ft. were bored by auger, the next 1715 ft. by churn drill, and the rest by diamond drill. More than 700 carats of diamond were used up. The total cost of the bore was about $72,900. It was expected that the coal measure would be struck at 4920 ft. and the original diameter of the hole was made to accord with that assumption, but when that depth was exceeded, the hole had to be enlarged, thus much increasing the cost and the working time. Other deep boreholes have been sunk in Germany at from $4.35 to $5.80 per foot. The rods were constructed of Mannesmann tubes, the 6560 ft. running length of the tubes weighing 31,305 lb. At 1640-ft. depth, the temperature was 79 deg. F.; at 3280 ft., 104 deg. F.; at 4920 ft., 156 deg. F.; and at 7287 ft., 182.1 deg. Fahrenheit.

# The Psychology of the Illegal Strike

By E. L. Cole

*SYNOPSIS—A review of the recent "button" strikes in the anthracite-coal field. The author presents some thoughts and brings out a number of points not generally known to the public at large. According to his version the miners have repeatedly violated their agreement.*

A survey of the industrial world reveals the fact that the labor unions are not rigidly adhering to their contract agreements signed by employers and their employees who are members of labor organizations. And this is true notwithstanding that it was organized labor that initiated the contract form of agreement in the hope that by means of periodical conferences between labor and capital, more amicable relations would thus be maintained, and the wasteful strikes relegated to oblivion. The labor organizations, alone, are guilty of violating the agreements that have been thus legally made. This illegal attitude on the part of organized labor is not confined to any particular industry or country. The dock laborers of England, the miners of Great Britain, the railway workers of France, and many others have in times past been found guilty of violating their contracts.

The numerous violations of the agreement entered into by the anthracite operators and the U. M. W. of A. has given much cause for comment in the press. The executive officers of the coal companies seem to be at a loss how to account for the irresponsible attitude of the miners, and more than one manager has despaired of being able to operate his collieries continuously.

## Causes of the "Illegal Strikes"

An investigation of the causes of these "illegal" strikes brings to light a number of interesting points. Since the present contract between the anthracite operators and miners was signed, the U. M. W. of A. have posted at the collieries an alleged remark of G. F. Baer, who is reported to have said to the union officials: "When you succeed in enrolling the employees of our companies in your union, we will recognize your organization."

Furthermore, while the miners realize that they are now working under better conditions than have ever before been obtained, they are, nevertheless, far from being satisfied. At the recent district conventions, when the officers were interrogated by the radical element of the organization, as to why they did not insist on further concessions from the operators, they have replied that the concessions secured were all that could logically be expected in view of the numerical strength of the organization. This reply of the union officers shows that they believe that it is only necessary for the miners to join the union and whatsoever concessions they may desire at the termination of the present agreement will be theirs for the asking.

Here then we have the real reason for the so called "button" strikes. Most of the miners have been persuaded to join the U. M. W. of A. in hope that the next conference will find them not only numerically strong, but also with substantial resources with which to carry on the fight. One of the means employed to increase the membership of the miners union is the work of the "button committee" at each colliery. This committee is usually made up of aggressive union men; they do not mince words when engaged in seeking additional members, and in more than one instance men have refused to join, or to continue paying dues, because of the insolent and domineering attitude of its members. No one cares to do what is compulsory, and it may not be amiss to suggest that a more diplomatic course would result in less friction.

When the miners call a "button" strike they state that they are not on strike, but have simply stopped working with nonunion men, for whom they have secured an advance in wages. Therefore, they reason, it should be compulsory for these men to pay tribute to the U. M. W. of A. They further aver, that the responsibility for the stoppage of operations, should be laid at the door of these nonunion men. That this is illogical is readily apparent to any thinking man, and the organization will undoubtedly find their "illegal" strikes an obstacle in their path when they seek to secure further concessions.

## The Radical Element

In justice to the national officers it must be said that they have placed themselves on record as being opposed to what they are pleased to term these "petty" strikes. No strike is "petty" that causes a loss of even one day's production of a product for which there is a ready market; and surely, a strike is not "petty" when a cessation of work causes a loss of hundreds of thousands of dollars in wages, and thousands of tons of coal. The men do not seem to realize that the permanent success of their organization rests on the strict adherence to the orders of their officers. Ever since President White has been in office a large number of miners have boldly disregarded his instructions, and their illegal acts have caused their executive officers considerable embarrassment.

Since the resumption of operations after the Tri-district Convention of May, there has been circulated through the coal fields, statements that boldly denounce the agreements. One radical magazine states that the men have been handed over to their employers, bound hand and foot, for four years; furthermore, the miners are advised that they are morally right in refusing to mine coal whenever they think that a stoppage of work will injure their employer financially. As the operators cannot recover any losses sustained, it can readily be seen that they are helpless, unless they should do the same as the miners and violate their agreements; it is only fair to say that they have so far scrupulously observed the letter and spirit of their contract.

The recent Panther Valley strike was probably the largest of the "button" strikes, in point of tonnage lost. It occurred while the Seventh District convention, of which the Panther Valley is a part, was held. Toward the close of the meeting, the men were addressed by James Mauer, of Reading, the lone Socialist member of the Pennsylvania Legislature, (but who has since been defeated in the recent election). The result of his fervent appeal to class-hatred was that within a few hours every colliery in the Panther Creek Valley was closed down and remained closed until the Conciliation Board found a way out of the difficulty.

Too often the officers are prone to pay undue attention to the enhancing of their personal fortunes within the organization, instead of discharging the duties for which they are well paid.

### The Duty of the Mine Officials

There is strenuous work ahead for the officers of the U. M. W. of A. Theirs is the task of combating the schools of radical thought, both politically and industrially. On the other hand, should the work of the opponents of present-day organized labor be permitted to go unchallenged, we shall soon see two labor organizations in the coal fields. As a matter of fact, it is an open secret that representatives of the radical element among the miners, have recently succeeded in organizing more than one branch of their school of thought in the very heart of the anthracite field, and it is their boast that April, 1916, will find the U. M. W. of A. fighting for its life. They further contend that in the meantime they will so thoroughly inoculate the miners with their conception of the moral and statutory law that there will be an entirely new method of industrial warfare inaugurated.

It will be readily acknowledged that, through the U. M. W. of A., the coal miners of this country are better recompensed for their labor than ever before. All who have the well-being of the present-day society at heart should do all that can be done to keep organized labor on a high plane of honor so that its existence will result in a permanent industrial peace.

When the district officers of the U. M. W. of A. were recently interviewed, they averred that inasmuch as the "check off" is not in effect they cannot be held responsible for illegal strikes. They have said: "If we had the 'check off' and the miners should cease working without just cause, we would at once suspend the guilty locals and immediately end the strikes." The question arises: If all the miners could be suspended when the "check off" is in effect, why can't the union miners be suspended by their officers today? What answer will the miners' leaders make to the operators in 1916, should they be refused recognition because they have given such little evidence of their ability to control the miners?

The responsibility for the numerous illegal strikes rests squarely on the shoulders of the union officers. They have failed so far to maintain the production of coal, which is one of the foremost reasons they always advance when seeking recognition at the hands of the operators.

The usefulness of the U. M. W. of A. in the anthracite field will be limited unless there is a peaceful adherence to the legal and advantageous wage agreement entered into last May.

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# Guarding Coal Mines against Fuel Wells

*SYNOPSIS—At its meeting on Mar. 11, the national fuel-well committee prepared an act to regulate the drilling of oil and gas wells through coal. The text of this measure is here given in full. The recommendations of the Bureau of Mines required that there should be two casings, the diameters of which varied 4 in., and that the drillhole should be 4 in. larger than the outer casing. The committee dispenses with this exterior pipe altogether and requires that the single casing which is retained shall have an internal diameter 6 in. less than that of the hole. The annular space between the casing and the walls of the hole may be filled with either cement mortar or puddled clay. The bureau's recommendation proposed only the latter. The thickness of the casing is not specified though this was a feature of the original draft.*

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**An act to provide for the location, drilling, casing, protecting, operating, abandoning, plugging and filling of natural gas and petroleum wells, and for the protection and preservation of life and property, especially in and about coal mines in gas and oil regions, creating the office of chief inspector of natural gas and petroleum wells, and providing penalties for the violation of this act.**

#### ARTICLE 1—Definitions

Section 1. Be it enacted, etc., that for the purposes of this act, the terms and definitions contained therein shall be as follows:

**Well**—A borehole drilled for the purpose of developing natural gas or petroleum, or a borehole producing natural gas or petroleum.

**Well Operator**—Any person, persons, firm, partnership, corporation, company, or association, who drills, operates or abandons, or purposes to drill, operate or abandon such well as hereinbefore defined.

**Coal Operator**—Any person, persons, firm, partnership, corporation, company, or association, owning, leasing or operating coal mines, or coal properties, but excluding coal stripping operations.

**Plat**—A map, drawing, or print, made in accordance with the provisions of this act, as hereinafter contained.

**Casing**—The pipe commonly used within wells drilled for natural gas and petroleum. The sizes of casing refer to nominal commercial dimensions.

**Cement Mortar**—Cement mortar shall consist of one part of portland cement and two parts clean sand, mixed with sufficient water.

**Coal Bed**—A workable bed or seam of coal that may be mined during the reasonable life of a well, proposed to be drilled through it.

**Well Inspector**—The chief inspector of natural gas and petroleum wells, or his duly authorized deputy.

#### ARTICLE 2—Location of Well

**License**—Section 1. When a location for a well has been made, the well operator shall make application in writing to the chief well inspector, for a license to drill, and send therewith a description and plat in duplicate of the proposed location.

**Survey**—Section 2. The location shall be determined by survey, and the description and plat shall give the courses and distances from two permanent points on the boundaries of the tract of land upon which the well is located, together with the name of the tract of land, names of adjoining tracts, township or district and county.

**Copies of Plat**—Section 3. The well operator shall send to the coal operator, if known, and to the state coal-mine inspector, a copy of the description and plat filed with the chief well inspector.

**Verify Location**—Section 4. Immediately on the receipt of the plat the coal operator shall verify the well location and mail, to the well operator, a plat showing the present and proposed mine workings under the tract of land on which the proposed well is located.

**Time Limit of Complaint**—Section 5. The license to drill shall issue immediately on the expiration of five days (excluding legal holidays) after the application and the plat of location have been received by the well inspector unless he makes or shall have received notice of complaint during that time.

**Time Limit to Issue License**—Section 6. If notice of complaint is made by or served on the well inspector within the said five days, then it shall be the duty of the well inspector to confer with the several interests, including the state mine inspector, coal operator, well operator, and where possible the owner of the land and of the royalty interest, and designate, within 10 days of the receipt of the application for license, a suitable location for the well, or if no well can

be drilled on the premises because of conditions hereinafter specified, refuse to issue a license to drill.

**Resurvey**—Section 7. If the well is relocated, a resurvey shall be made by the well operator, and corrected description and plat mailed as previously required.

**Mine Plats**—Section 8. Each coal operator shall furnish annually to the inspector a plat of all of his present and immediate projected mining operations within the state showing the location of all known wells. The coal operator shall also furnish, if requested, to any well operator, a plat of the mine under the leases or property owned or operated by the said well operator.

**Distance from Buildings, Etc.**—Section 9. No well shall be located within 300 ft. of a hoisting or air shaft, slope or drift into an artificially ventilated coal mine when not definitely abandoned or sealed, nor shall such well be located within 300 ft. of any mine shaft house, boiler house, engine house, power house, mine fan, or mine tipple, unless such structure has been abandoned.

**Distance from Mine Ways**—Section 10. No well shall be drilled within 15 ft. of any underground haulage way, traveling way, drainage way or air way.

**Display of License**—Section 11. It shall be the duty of the chief well inspector to issue the license in duplicate, and the well operator shall display at the location, one copy of the license properly protected from injury, and in such place and manner that it may be easily seen.

**Duration of License**—Section 12. The license shall expire at the end of one year from the date of issue unless drilling operations are actually in progress.

### ARTICLE 3—Manner of Drilling and Protecting Well

**Through Workable Beds**—Section 1. Each well passing through a workable bed of coal shall be drilled, cased and protected in the manner hereinafter provided:

(a) Where the coal is in place.

A hole of a diameter 6 in. greater than the inside diameter of the outside casing to be put through the coal shall be drilled at least 30 ft. below the bottom of said coal bed.

Within this hole shall be placed the casing, and the space between the outside of said casing and the wall of the hole shall be filled with cement mortar, or puddled clay, to a height of at least 30 ft. above the top of said coal bed, to exclude water from the coal bed.

(b) Where the coal is removed and the mine excavation is inaccessible.

A hole of a diameter sufficiently large to permit the setting in of a liner 4 in. larger in diameter than the inside diameter of the casing to be put through the coal, shall be drilled at least 30 ft. below the bottom of said coal bed.

Within this hole shall be placed a liner 4 in. larger than the inside diameter of the said casing and extending from the bottom of said hole to at least 30 ft. above the mine roof.

A string of casing centrally guided by shoes or winged guides shall be placed within the said liner and the space between the liner and the casing shall be filled with cement mortar or puddled clay to the top of the liner.

To exclude water, the space between the said casing and the wall of the hole and immediately above the top of the liner, shall be filled for a distance of at least 10 ft. with cement mortar or puddled clay.

(c) Where the coal is removed and the mine excavation is accessible.

The method may be either as provided in the case of inaccessible mine excavations or as where the coal is in place, provided that if the latter method is chosen the well operator shall at his own expense provide a suitable retaining wall laid in cement mortar to retain the cement mortar or puddled clay about the casing. This wall shall extend from 2 ft. below the mine floor to the roof of the mine, and be of such size as to retain at least 2 in. of puddled clay or cement mortar about the said casing.

**Affidavit as to Casing**—Section 2. The well operator shall upon completion of the work of casing through a coal bed make an affidavit signed by two men having at least three years' experience in casing wells as to the method of casing and protecting the well; said affidavit to be filed with the chief well inspector

**Vent**—Section 3. Under any of the above provisions the work of casing and protecting from gas and water through the coal bed shall be completed before the well is drilled to a greater depth; and in the event of any well being productive of oil or gas, the space between the said outside casing and the next string of such other casing as may be left in, shall remain open, the top being provided with a suitable device to permit ventilation and at the same time to prevent dirt or débris from falling in, or being thrown in, or the ventilating opening from being readily closed.

### ARTICLE 4—Abandonment of Well

**Notice**—Section 1. The well operator when he purposes to abandon any well, shall send a written notice of his intention to the chief well inspector, and the work of plugging the hole or pulling the casing shall not proceed until the well inspector is present to see that said plugging is done as prescribed by this act, except as hereinafter provided.

**In Absence of Inspector**—Section 2. In case the well inspector fails to be present within three days from receipt of notice, then the work may proceed provided that two men having experience of at least three years in the plugging of wells be present, and make affidavit in duplicate that the work was done in accordance with the provisions of this act, said affidavits to be filed with the chief well inspector, and made a record of his office.

**Copy of License**—Section 3. The well operator shall send to the chief well inspector with the notice of abandonment, a legally certified copy of the license to drill, provided the well was drilled under the provisions of this act.

**Locating Old Wells**—Section 4. If the well was drilled prior to the passage of this act, the well operator shall send to the chief well inspector, with the notice of abandonment, a description and plat showing the location of the well as herein provided for in the application for license to drill.

**Method of Plugging**—Section 5. Every well upon abandonment must be plugged and filled solidly and tightly from the bottom to the top as follows:

The hole must be filled with rock sediment, sand, clay, or other suitable material from the bottom of the well to a hard and firm stratum below the last string of casing set in above the producing oil or gas sands. When the well inspector declares that it is impracticable to fill the cavity in the lowest producing sand then he shall permit the well operator to place plugs at the top of the lowest producing sand and fill as hereafter specified.

In this firm, hard stratum three seasoned wood plugs of a diameter equal to the diameter of the hole, and each of a length of at least 3 ft., shall be driven into place. Above the third plug 10 ft. of clay must be placed and thoroughly tamped down so as to prevent the passage of oil, gas or water.

Immediately below the seat of each and every string of casing there shall be driven a seasoned wood plug as described, and all spaces between wood plugs shall be filled solidly and tightly with rock sediment, clay, sand or other suitable material as the casing is withdrawn length by length. All plugs shall be driven in place with proper drilling tools.

In the case of a well in which the outside casing has been cemented as herebefore provided, said outer casing may be cut off at a point not less than 50 ft. above the coal bed and removed, but in any event the hole shall be filled to the surface.

The location of the plugs herein provided for are made with reference to the relative positions of the workable coal beds and the gas and oil sands, for the purpose of preventing the passage of oil or gas into the workable coal beds and of water into the oil and gas sands, and if any well presents a variation in such relative positions of the said strata, such additional wood plugs as the well inspector may deem necessary shall be driven into place by the well operator.

**Report of Plugging**—Section 6. When the work of plugging and filling from bottom to top has been completed, the well operator, or his authorized agent, shall make a report in duplicate to the chief well inspector, upon forms to be furnished by the well inspector, showing the date of completion of the well, the depths to the coal beds, the names of, and depths to, all productive oil or gas measures, the total depth of the well, and the location and kind of all plugs and filling used, and the method followed in placing the same.

Section 7. If the well inspector has been present during the performance of this work, he also shall sign the report to the chief well inspector.

Section 8. If the well inspector has not been present, this report shall be joined in by two men employed on the work as provided for in this act.

**Protection of Casing by Coal Operator**—Section 9. When the coal is removed from around a well casing or liner, the coal operator shall protect the same from corrosion and mechanical injury by a wall of suitable material to retain 2 in. of cement mortar between the said wall and the said casing or liner; this protection shall extend from 2 ft. below the mine floor to the roof of the mine, except in the case of an abandoned well, which has been plugged and filled as prescribed in this act.

### ARTICLE 5—Chief Inspector of Natural Gas and Petroleum Wells

**Office**—Section 1. There is hereby created the office of chief inspector of natural gas and petroleum wells.

**Appointment**—Section 2. A chief inspector of natural gas and petroleum wells shall be appointed by the governor, or by a commission provided for the purpose, from an eligible list of men who have passed a satisfactory examination showing their technical and practical fitness for the position.

**Salary**—Section 3. The salary and necessary travel expenses of the chief well inspector shall be borne by the state, and an office provided and equipped with suitable filing arrangements.

**Bond**—Section 4. The chief well inspector shall, before entering upon the discharge of his duties, give bond in the sum of $———— with approved sureties for the faithful discharge of his duties; and shall take oath that he will discharge his duties with impartiality and fidelity to the best of his knowledge and ability. But no person who is acting as manager or agent of any oil or gas company, or any coal company, or who is interested in operating any oil or gas well or any coal mine, shall at the same time act as chief well inspector under this Act.

**Assistants**—Section 5. The chief well inspector shall be authorized to appoint field and office assistants whose salaries and expenses shall be borne by the state.

**Appeal**—Section 6. An appeal from the decisions of any assistant may be made to the chief well inspector.

**Duties**—Section 7. It shall be the duty of the chief well inspector to carry out all of the provisions of this act, and keep a complete record and prepare for publication, a yearly report of the wells drilled in the state, together with their location, date of completion, depth, character of product, date of abandonment, and name of owner, and other information.

The well inspector shall receive and investigate all complaints as to injury, present or impending, due to lack of precaution on the part of any well operator or coal operator. If he finds the complaints against the coal operator, well founded, he shall lay the facts before the mine inspector.

In case of failure of the well operator to plug an abandoned well, in accordance with the provisions of this act, it shall be the duty of the well inspector to have the work performed by contract, and to assess the cost against the well operator.

If the well inspector discovers any well being drilled, operated or plugged, contrary to the requirements of this act, he shall order the workmen engaged upon such well to cease work at once, and shall not permit the work to be resumed until he is satisfied that the law is complied with.

The well inspector shall determine the sufficiency of plats for the purpose of accurately locating wells, and shall cause a new survey of such location in case the available plat and descriptions are unsatisfactory. This survey shall be paid for by the applicant unless it is shown that the original plat is correct in which case the cost of the new survey is to be borne by the state.

It shall be the duty of the chief well inspector to transmit to the proper county recorder, the duplicate of plats, descriptions, applications and reports sent to him by well operators, and these shall be recorded in a book kept specially for this purpose by the county recorder.

**Height of Entry**—Section 8. To enable the well inspector to perform the duties imposed upon him by this act, he shall have the right at all times to approach and examine any well in his district, and with the authority of the state mine inspector, to enter any mine affected, and upon discovery of any violation of this act or upon being informed of such violation, he shall institute proceedings against the person or persons at fault, under the provisions of the law provided for such cases.

When a well is so located that it passes through a mine or near a mine, the well operator may appoint as his representative a mining engineer or other competent person experienced in mining operations, who shall, with the written permission of the chief or district state mine inspector have the right to enter the mine at such times as will not interfere with the operation of the mine.

**ARTICLE 6—Miscellaneous**

**Penalties**—Section 1. Any coal operator or well operator who neglects or refuses to comply with the provisions of this act, or who violates any of the provisions or requirements thereof, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof in the court of the county in which the misdemeanor was committed, be punished by a fine or imprisonment at the discretion of the Court.

**Constitutionality**—Section 2. Each section of this Act and every part thereof is hereby declared to be an independent section or part of a section and if any section or sub-section shall for any reason be held unconstitutional the validity of the remaining sub-section and sections shall not be affected thereby.

**Repeal of Conflicting Legislation**—Section 3. All acts or parts of acts inconsistent herewith are hereby repealed.

## Coal Mining Institute of America

The Coal Mining Institute of America expects to make its summer visit to the anthracite-coal regions. The program is not yet completed, but it is roughly as follows: Members will leave the bituminous field from Pittsburgh at 8:50 p.m., Monday evening, June 16, special sleeping cars being attached. The train will take up passengers between Pittsburgh and Tyrone and will arrive at Wilkes-Barre at 8.59 on Tuesday morning, June 17. Those who desire to make the interesting trip during the day may leave Pittsburgh at 7:50 a.m. on Monday morning, and arrive at Wilkes-Barre at 7:50 p.m.

The meeting for organization purposes will be held in Wilkes-Barre at 10:30 a.m., June 17. Luncheon will be at 12 o'clock. In the afternoon, a trip will be made to near-by collieries, and in the evening, after the institute banquet, H. G. Davis, district superintendent of the Delaware, Lackawanna & Western R.R. Coal Department, will deliver a lecture on anthracite methods of mining and will detail the sociological work which has been done by the company. The address will be illustrated by stereoptican slides.

The following Wednesday, the 18th, the visitors will pass over the scenic Wilkes-Barre & Hazelton third-rail system to the latter town and view the anthracite strippings and collieries in that district. In the evening, the institute will invite the members of the local District Mining Institutes to meet them at Wilkes-Barre. Addresses will be delivered on soft-coal methods of mining and sociological work in the bituminous region, illustrated by the stereoptican and possibly moving pictures.

On Thursday, the 19th, a trip will be made to the anthracite collieries in the Wyoming Valley. From 3 to 5 o'clock a session will be held at Wilkes-Barre for a discussion on the impressions received while visiting the anthracite operations.

At 6:20 the train will leave Wilkes-Barre for Pittsburgh and other points in the bituminous-coal field. It may be added that the members are invited to bring their wives with them if they so desire. Several of the leading anthracite companies have, by their executives, expressed themselves much pleased to have an opportunity to show their hospitality to the members of the visiting institute.

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## A Special Pump Number

Our issue of Apr. 5 will be devoted entirely to the question of pumping at coal-mining properties. The various problems encountered in actual practice will be discussed in detail, while several modern types of pumps will be described. All readers of COAL AGE are invited to send us photos and data concerning interesting pump installations with which they are familiar. Copy should be in our hands within a week.

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## Entombed in a Kentucky Mine

It is reported that 130 miners were imprisoned Mar. 18 in a colliery at Basketts, Henderson County, Ky., by a cave-in, which clogged the mouth of the shaft. Though it is stated that the men had not escaped when the report arrived, it was said that there were no fatalities. It was expected that the men would soon be released by way of the air shaft.

# CURRENT COAL LITERATURE

## A Benzine Incandescent Safety Lamp

By Emmanuel Lemaire*

*SYNOPSIS—M. Goulet has introduced a safety lamp which utilizes an incandescent mantle to intensify the light. The oil is vaporized and mixed with air in a carburetor resting on the top of the lamp. The illuminating power is from 1 to 3 cp.*

Improvement of the illuminating power of safety lamps is a great desideratum. Imperfect light is prejudical to the safety of the miner, reduces his output and causes him to do poor work. To it is also attributed, in part at least, that occupational disease of the miner known as nystagmus.

It is true that there are many mining lamps which offer a high degree of security as regards gas, but their average illuminating power in practice is low and hardly reaches one unit Hefner[1]. Now that the question of safety is, in large part, solved, attention should be paid to improvement in lighting power.

### A Light with a Mantle Which Gives 3.2 C.P.

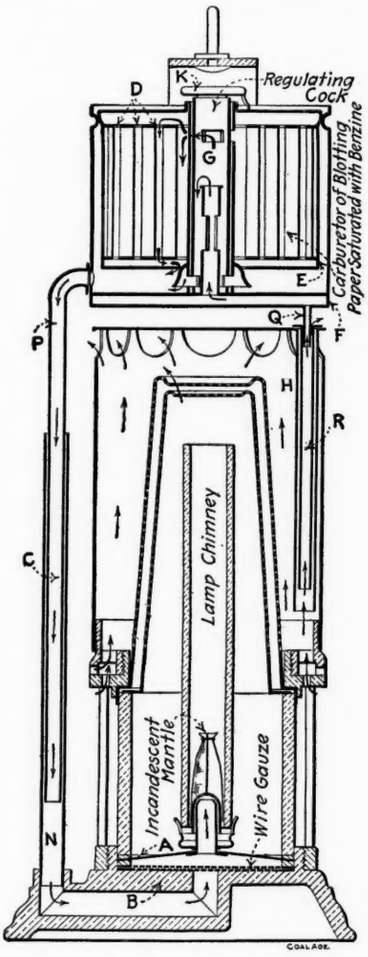
During the year 1910, a new lamp giving a better light than any of its predecessors was subjected to safety tests at the Belgian Experimental Station in Frameries. The inventor of this lamp, M. Goulet, applies the principle of incandescence, which has been so much developed since the appearance of the Auer mantle. Thus he has obtained a lighting power which may reach 3.5 Hefner units. The mantle is brought to incandescence by combustion of the mixture of air and benzine vapor obtained by using a carburetor.

As shown in the accompanying figure, the Goulet is in general arranged, like an ordinary safety lamp, with two gauzes and a bonnet. The oil reservoir, formed by the carburetor, instead of being below the burner, is on the top of the lamp above the bonnet. This position favors the flow of the combustible gas to the burner, since a mixture of air and benzine vapor has a density greater than that of air alone.

### To Improve the Draft a Chimney Is Provided

The burner is a simple copper tube, the bottom being inserted in an immovable metal disk *A*, resting by asbestos washers on a copper socket base *B*, which closes the lamp at the bottom. It is connected with the carburetor on the outside by a tube *C* and a conduit in the base *B*. The two gauzes placed below the disc *A*, as well as the double gauze which closes the burner at the top, checks any return of flame toward the carburetor.

The lamp is supplied with a glass and a chimney. The former is cushioned on the disk *A* by an asbestos washer. An inside chimney covers the burner and the draft it occasions favors the circulation of the air in the carburetor. The metal fixture or guard which protects the outside chimney, surrounding the lower part




The Goulet Lamp with a Lamp Chimney, Incandescent Mantle and Carburetor

of the lamp, and which supports the bonnet, screws upon the base *B*.

### The Benzine Is Not Free but Absorbed by Blotting Paper

An absorbent mass formed of blotting paper in layers, keeps the benzine in the carburetor quiet and is lodged in a sheet-metal cylindrical tank *E*, from the ends and side walls of which it is held free by supports. The mass is pierced with cylindrical vertical channels *D* for the passage of the air to the carburetor.

The tank *E* is placed within another cylinder *F*, which has a double bottom. The joint between the two,

*Chief Engineer of the Mining Corps attached to the Mining and Gas Accident Service, Belgium (Frameries Government Experimental Station). Professor at the University of Louvain.

Note—Translated from the French by E. F. Buffet for Coal Age.

[1]One Hefner candle is nine-tenths of an international candle.—Editor.

completely closes the outer cylinder at the top, the inner tank extending only part of the way down to the bottom of the outer, forming a false bottom.

A cylindrical sheet-metal cock, set vertically in the center of the double bottom, passes through the carburetor and provides a way for regulating the admission of air to that vessel. It puts the inside of the carburetor in communication with the space between the two bottoms of cylinder *F*, a space into which air enters through the tube *H** placed inside the bonnet of the lamp. The aforesaid cock is composed of two tubes, one outside the other, the inner tube being movable. This inner tube turns with light friction in the former, and is manipulated by a knurled head *K*.

These two tubes are pierced near each end with two apertures diametrically opposite each other. The lower openings of the movable tube are placed at right angles to its upper openings and the rotation of the tube is limited to a half turn by two stops.

### Regulation of Gas Mixture for Burner

The extreme positions of the movable tubes correspond respectively to a complete closing of the upper and lower apertures or to an uncovering of the lower openings with a closing of the upper apertures. The mean position is a complete uncovering of the upper openings with a closing of the lower ones.

For this position of the movable tube, the air enters tank *E* by the upper openings, becomes charged with benzine vapors by circulating around the absorbent mass and through the canals by which it is pierced, and passes to the burner by tube *C*. When the air enters by the upper openings, the proportion of benzine vapor contained in the gas reaches a maximum.

When the movable tube is turned to the extreme position, which gives the complete opening of the lower openings with closing of the upper, the air passes through these lower apertures into space comprised between the bottom of tank *E* and the double bottom of the cylindrical vessel *F*, and goes to the burner without coming in contact with the absorbent mass.

It merely mixes with the benzine vapors which issue from tank *E* through the space between the edge of the central orifice of the lower end of this cylinder and the cock. In this case the gas which reaches the burner is but feebly charged with benzine vapors.

### Carburetion of Air Fed to Flame May Be Closely Adjusted

For other positions of the movable tube, the lower and upper apertures are partly uncovered. A portion of the air comes in contact with the absorbent mass and the rest of it goes directly to the burner. The degree of carburetion of the air varies with the amount of opening of the upper apertures and this carburetion is so regulated that the mantle is brought to maximum incandescence.

To extinguish the lamp, we simultaneously close the upper and lower openings in the cock. Nevertheless the benzine vapors produced in the carburetor continue to reach the burner, so that the extinction is not always complete, but in this case a light blow on the side of the lamp will extinguish it.

*The tube H is simply described as a tubulure; but from the illustration the tube is double.

The mixture which passes out of the carburetor contains a quantity of air too small to insure complete combustion; admission of supplementary air is therefore necessary. This enters the lamp through the double gauze which surmounts the lamp glass and reaches the burner by openings in the bottom of the ring, or fixture, which supports the chimney.

### The Lamp Locking Mechanism

The outside tube *C*, which leads the combustible gas to the burner, is formed by two tubes, one sliding in the other. The outside tube *N* is soldered to the base *B* and the inside tube *P* to the carburetor. The open tube *H* through which the air enters the carburetor comprises an inside tube *Q* soldered to that tank and an outside tube *R* fixed to the inside of the bonnet.

When the carburetor is in place, the tubes *P* and *Q*, which engage in the tubes *N* and *R*, oppose the unscrewing of the fixture or guard which supports the bonnet, and in consequence the opening of the lamp. Thus, until the carburetor is removed, it is impossible to unscrew the lamp. The carburetor is held by a sort of yoke, the ends of which are attached to the bonnet at two diametrically opposite points. These ends engage in two eyes on the bonnet and are held by two magnetically controlled bolts. The yoke carries the hook for the suspension of the lamp.

Points of support fixed under the carburetor prevent it from resting directly upon the top of the bonnet, and thus keep it from becoming excessively heated.

The lighting power of a Goulet lamp has been found to be 3.2 Hefner units, after having been burned for a half hour and 1.25 Hefner units after nine hours of lighting. It is important that the mantle be well adapted to the burner, otherwise the lighting power is much less.

### Lamp Showed Good Results in Gas Tests

The safety tests have given the following results:

The Goulet lamp resisted a current of air containing 8 per cent. of methane, and traveling at a speed of 15 m. (49.2 ft.) per sec. The gas mixture was caused to travel in 5 different directions, namely, horizontal, descending and rising at 45 deg., ascending and descending vertically.

The gauze became heated to redness when the air traveled at the following speeds and under the conditions specified.

8 m. (26.2 ft.) per sec. or 1575 ft. per min. in a horizontal current;
6 m. (19.7 ft.) per sec. or 1181 ft. per min. in a current descending at 45 deg.;
9 m. (29.5 ft.) per sec. or 1772 ft. per min. in a current rising at 45 deg.;
13 m. (42.7 ft.) per sec. or 2559 ft. per min. in a vertical ascending or descending current;

The outside chimney was broken at the speed of 14 m (45.9 ft.) per sec. or 2756 ft. per min. in a current descending at 45 deg.; it resisted in the other currents. The inside chimney was not broken in any of the tests, but several times it softened to a point of bending and even of closing partially or completely at the top.

### The Carburetor Does Not Explode When Heated

When placed in an atmosphere at rest, the Goulet lamp becomes considerably heated. In order to make sure that an excessive heating of the lamp would not create

a dangerous pressure in the carburetor, the latter was heated directly by a bunsen burner so intensely that the solder was fused. This did not lead to an explosion of the carburetor; when the solder melted, the benzine vapors were simply ignited by contact with the bunsen flame. As has already been said, the opening in the base of the sheet-metal casing, which contains the absorbent blotter is larger than is needed to permit the regulating cock to pass through, thus the benzine vapor produced in the carburetor can always escape through the burner.

In the preceding experiment it was found that some benzine was condensed in the conduit at the base of the lamp. The presence in such a place of liquid benzine not retained by an absorbing substance, could not be otherwise than objectionable if the lamp were reversed. It seems, however, that there is no need of worrying about this cause of danger, since it has never been found that benzine vapors produced in the carburetor by normal heating of the lamp, even in an atmosphere at rest, become condensed in the conduit of the base.

When the tank with its absorbing substance is put in to place immediately after having been dipped and before it has been allowed to drip, the benzine in excess falls into the base of the lamp. Although this benzine rapidly evaporates, it is better to wait a few moments before putting the tank in place after filling. The porous substance absorbs 65 grams of benzine (0.143 lb.).

### No Risk of Back Firing of Carburetor

With a view to determining the degree of explosiveness of the gas produced in the carburetor, the gas was lighted several times as it issued from the burner. Although the wire gauzes, which are intended to prevent a return of flame, were removed, the fire was never transmitted as far as the carburetor.

The Goulet lamp seems to be reasonably safe in gas. It is an interesting attempt to improve the lighting power of mining lamps and for this reason it deserves notice. It is, however, too early as yet to judge of its practical availability in the mines.

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# Gleanings from British Experience

Special Correspondence

*SYNOPSIS—A digest of the worth-while coal news from the British Islands. The reports from the institutes illustrate the trend of the mining industry and the efforts put forth to increase safety.*

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The English practice seems strongly in favor of the use of armored cables. The British electrical inspector of mines, Robert Nelson[1], advocates covering all insulating material with a grounded metallic cover, as a protection from leakage even when using low-pressure currents, by which he means those not exceeding 250 volts. That being his advice, we are somewhat surprised that he finds it necessary to add that those who fail to armor and ground cables carrying more than a medium pressure (over 650 volts) are inviting accident.

He points out that fuses and circuit breakers (or "maximum cutouts," as our British friends term the latter) are called into action only in the event of the strength of the electrical current exceeding a certain predetermined value, namely, that at which the fuse is set to melt or the circuit breaker to operate. The protection is, therefore, in no manner sensitive, and in a current so protected a mere overload may cause the current to be cut off.

### Importance of Leakage Cutouts

On the other hand, leakage cutouts do not operate on an overload, temporary or permanent, so long as the flow of current is confined to the conductors. They only act when some portion of the current elects to leave the path provided for it and returns to the generator by some other way, possibly by the earth. When that occurs there is a "fault" on the circuit, and the balance which normally exists at every instant between the current which enters and that which leaves the conductors of a healthy circuit, is disturbed at every point. Leakage cutouts are operated by disturbances only; that is, they act only in case of a fault. A break in the line, caused possibly by the fall of a rock, puts the cutout into action and thus the sparking is immediately stopped.

### Bare Signal Wires May Cause an Explosion

As Mr. Nelson recalled, an explosion in South Wales was attributed to bare signal wires. Men were engaged removing a fall when the electric bell was heard to ring, though there was nobody at the other end to operate it. There was a second ring, and almost at the same time an explosion occurred which burned five or six of the men. Those who investigated the accident agreed that something had brought the two bare wires into contact.

An extensive knowledge of the theory of electricity is not necessary to enable a colliery manager to take an active interest in the electrical plant under his charge. What he needs to learn is easy of attainment, but if soundly applied, he should be able to supervise the electrician effectively, to the advantage of that official and of the plant under his care, and in the interests of safety and efficiency.

### Will the Byproduct Market Fail?

In a recent paper, J. E. Christopher[2] stated that in 1900 the world's output of sulphate of ammonia was under half a million tons. Now it is more than doubled, but the price has been well maintained. There is plenty of scope for the use of sulphate of ammonia, and the outlets for tar also appear promising, with the increased demand for use in surfacing roads.

The main outlet for benzol is for use in automobiles. Assuming an average yield of one gallon of automobile benzol per ton of coal, Mr. Christopher estimates the coke

[1]In an address before the North Staffordshire Institute of Mining and Mechanical Engineers.

[2]Paper read before the Manchester section of the Society of Chemical Industry.

works of Great Britain can turn out 19,000,000 gal. per annum, without overstocking the market, so that the field for the exploitation of benzol is extensive.

The production of gas for purposes of illumination as a byproduct of the coke industry has lately made considerable headway. In the period 1903-1910, the amount of gas produced in Germany in this way has increased from 13,750,000 cu.ft. to 1,472,000,000. It is not suggested that gas manufacture in coke ovens will ever displace the modern vertical retort, with its advantages of continuous carbonization; but an attempt has been made to show that coke-oven gas is nevertheless a valuable byproduct which cannot be overlooked.

### Controllers for Hoisting Engines

James Black[3] recently stated that with the passing of the British Coal Mines Act, 1911, numerous controllers have been placed on the market, which prevent an excessive hoisting speed.

It is his opinion that the speed of an engine should be controlled throughout the whole length of the hoist, because: (1) Complete control is accompanied by no disadvantage whatever, as it can be adjusted to permit any margin above the normal hoisting speed, and consequently does not interfere in any way with the output of the shaft; (2) the controller will not come into operation at any point during the hoist unless the engine is running faster than the predetermined safe speed at that point; (3) the engine speed, and, therefore, also the speed of the cage when it comes into operation, is likely to be less with complete than with partial control. Controllers are also so constructed that they act instantly if the engine is started in the wrong direction.

### Relics of Early Mining

Mines of the Glengarnock Iron & Steel Co., near Stevenston, in Ayrshire, date back to the 17th century. The coal was drawn from the working faces to the main roads by children, the coal being placed on small sledges to make the transference less difficult.

A part of one of these sleds is all which has survived from that remote time. The coal was reloaded at the main roads into creel-like baskets and carried by women up a staircase in the shaft to the surface.

Toward the end of the eighteenth century, the coal was hauled to the shaft landing on large sleds and hoisted to the surface probably by a horse gin. Simple methods for draining mines were also introduced and implements for this purpose have been discovered in the mine, including a wooden shovel, coal picks, a wooden bowl for ladling water and a number of tallies or pins similar to those used today by miners in Scotland for marking coal wagons before sending them to the surface. These relics are deposited in the Scottish National Museum, the gift of Robert Main, general manager of the iron company owning the mine.

### Prime Mover of the Future

In his lecture on "Prime Movers," before the Greenock Philosophical Society, S. U. de Ferranti declared that the electric motor, actuated by electricity from central power stations, is displacing all forms of small engines. He thinks it probable that in future small prime movers will be required only to propel cars and boats, and that all stationary power generators will be electric. Reciprocating engines will be used, no doubt, for a long time, but they can only be regarded as makeshifts, and as soon as an equally efficient machine for any particular purpose is developed, it will replace the reciprocating prime mover.

It is difficult to predict the form of the prime mover of the future, but in search of the highest economy, and with the limitations of temperature imposed by known materials, Mr. Ferranti is inclined to look to electricity, converting the energy of the fuel at low temperature and giving its power in rotary form, as the most likely eventual solution.

### Peat Coke

The Peat Coke & Oil Syndicate, of Doncaster, in Yorkshire, is developing a new invention for treating special dried black peat and converting it into a hard foundry coke, byproducts being tar and tar liquor, from which can be distilled fuel and automobile oils. It is not claimed that all kinds of peat can be profitably utilized, but it is said that thousands of acres, containing millions of tons of peat, by this process can yield results satisfactory as a commercial undertaking.

The bottom or black layer of the peat is most suitable for the manufacture of coke. This is freed from an excess of moisture and subjected to a carbonizing process by which the byproducts are recovered, the residue being a soft, friable coke. Although peat coke contains a lower percentage of sulphur than other fuel, a difficulty hitherto has been to produce a coke from it hard and strong enough to hold up in the smelting furnace. This, it is said, has now been overcome, a hard, strong, clean coke being the result. Analysis by a German chemist, based on 1000 tons of air-dried peat, show that the following results can be obtained: Coke, 400 tons; tar, 40 tons; tar water, 400 tons. The tar can be further distilled, yielding 18 tons of crude oil, 2 tons of creosote oil, 2 tons of pitch, 8 tons of paraffin. The tar water will yield 4 tons sulphate of ammonia, 6 tons acetate of lime, 2 tons methylic alcohol. It is estimated there will be a profit of 90c. on every ton of prepared peat so treated.

## A Hoisting Accident

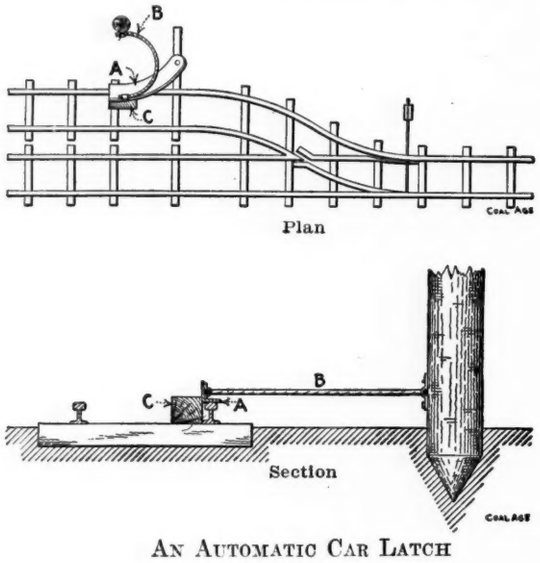
The *Colliery Guardian* says: "An accident in which 14 men were killed and four others injured, occurred on Feb. 7, at the Rufford shaft of the Bolsover Colliery Co., Rainworth, near Mansfield, close to the Nottinghamshire and Derbyshire line, England. A large barrel, containing about 900 gal. of water, fell a distance of 480 ft., and struck a platform in the shaft on which were 18 sinkers, who were engaged in tubbing. The barrel was being hoisted when the rope was overwound and thus broken. In falling, the barrel broke the scaffolding, and all the men, dead and living alike, were thrown into the water beneath them. The five survivors clung to the wreckage and were ultimately rescued.

The overwinding was caused in a peculiar way. While the engineman, Sidney Brown, was working the controlling levers, a horsecloth which had been placed beneath the roof of the engine house to keep out the rain, fell upon him, and at the same time some wooden laths used to support it dropped between the levers. Momentarily blinded by the canvas, Brown was unable to pull the laths from between the handles and to stop the hoisting engine.

[3]Paper read before the Scottish members of the National Association of Colliery Managers.

## Automatic Car Latch for Siding

To prevent cars underground when run upon an incline from sliding back and doing mischief, there is installed in the Sterkrade mine, Oberhausen, Germany, a sort of latch or chock, which lets the car pass freely forward upon the incline, but bars its return.




AN AUTOMATIC CAR LATCH

This device is shown in Figs. 1 and 2. The latch consists of an angle iron *A*, bent in a circular arc, pivoted beside one rail and resting upon it. A spring *B* made of old wire cable, presses this angle iron against a stop *C*, thus holding it in place. If a car runs forward on the track its wheels push the angle iron aside against the force of the spring. When the car has passed, the spring restores the angle iron to its position against the stop and thus blocks the rail.

Note—Translated from "Glückauf," Feb. 22, 1913.

## Seventh Bituminous District (Penn.), 1912

The advance report of C. P. McGregor, mine inspector of the seventh bituminous district in Pennsylvania, for 1912, shows 30 mines in operation, 15 gaseous, 13 nongaseous and two new mines opened; total production of coal, 5,740,099 tons, of which the Pittsburgh Coal Co. produced nearly one-half, or 2,777,404 tons. The number of persons employed in the mines was 6402; the number of fatal accidents inside the mines, 15; nonfatal accidents, inside, 54; outside, two.

The death rate shows 426 persons employed inside the mines and 382,673 tons of coal produced, per fatal accident inside. The causes of fatal accidents showed the following percentages: Falls of roof, slate and coal, 40 per cent.; mine cars, 40 per cent.; electricity, 13.3 per cent.; drawing timber (one accident), 6.7 per cent. The causes of nonfatal accidents, inside the mines, showed the following percentages: Falls of roof, slate and coal, 70.38 per cent.; mine cars, 7.41 per cent.; explosions of gas and dust, 5.55 per cent.; blasting, 3.70 per cent.; machinery, 3.70 per cent.; electricity, 1.85 per cent.; miscellaneous, 7.41 per cent.

## Waste

BY BERTON BRALEY

Written expressly for "Coal Age"

If only our fathers had faced
The problems we face in our mining,
If *they* were less given to waste,
*We* might be less prone to repining;
They worked with a carelessness vast
And they left us a burden unpleasant,
For the Waste of a bounteous past
Is the Coal of a close-fisted Present.

We are saving the culm which they lost,
We are working the gobs that they filled,
And we seek to recover the cost
Of the coal they left standing—or spilled;
For somehow they never caught on
To this item of sane information,
That the culm of the days that are gone
Is the Coal of a new generation.

Now they probably thought they were wise
And we think we are careful and tasteful,
Yet our sons, without doubt, will devise
New methods which make US seem wasteful;
For this we must learn—or we pay
In trouble and money and sorrow—
That the Waste of a Careless Today
Is the Coal of a Careful Tomorrow!

## BY THE WAY

**In skating over thin ice our safety is in our speed.**

**A single breaker may recede even though the tide is coming in.**

**Paint Creek miners are showing up fast on the initiative, but are lacking in control on the referendum.**

**The difference between landscape and landscape is small, but there is great difference between the beholders.**

**Never judge a coal camp by the mine whistle—some of them have to shut down the works when they blow.**

**The United States imported 32 million dollars worth of diamonds in 1912. However, we sold foreign countries 59 million dollars worth of "black diamonds"—so we got "ours."**

**Thespian talents are a failure when applied to coal mining, according to a suit recently filed in Chicago by Mrs. Richard Harding Davis (née Bessie McCoy), the well known actress. She and others of her company were induced to invest in an Indiana coal property for which they are said to have advanced the necessary funds to meet the last pay-roll before the concern became defunct.**

**A special cable to the New York Times states: "An official notice has been issued to the effect that six large spiders have been added to the Canal forces. They are to be used for spinning threads for use in the engineers' transits." It is said the new spider department is being double shifted, which speaks bad for the carelessness of the engineering corps in the matter of handling their instruments. Too bad to waste good money cabling the "discovery" of a new method long ago abandoned.**

# EDITORIALS

## The Eight Hour Day

There are certain labor agitators at work at the present time to influence opinion and secure the passage, by the Legislature now in session, of a bill to reduce the time of labor for all minors, or persons under 21 years of age, from the present nine hours to eight hours a day.

This action is being promulgated under an assumed sympathy and consideration for the young who work underground. Such a purpose, at any other time, would be accepted as just and humane. Consideration for the young is a noble trait; but when such assumed consideration is clearly only a guise under which the work of mining coal is being performed at the present time in the anthracite mines of Pennsylvania, and upon which the price of labor, including monthly and shift rates, is based, the attempt appears in its true light.

The miners and their representatives must show as high a regard for their agreement with the operators, as consideration for the young. They should be reminded here of the old saying—"Consistency, thou art a jewel." Be honest, stand fast to the agreement, and when that expires it will be the proper time to show *consideration for the young,* which is made the pretext for the present action. It would, indeed, have been more honorable on the part of the miners, and their desire would have been received with greater favor by the general public, had they sought this as a concession from the operators, instead of attempting to force a bill through the Pennsylvania Assembly that practically abrogates the miners' agreement now in force.

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## Mining Legislation

It is reported that the so called Schaeffer bill that has been before the Pennsylvania Legislature during the present session, has passed the House by a practically unanimous vote and now goes to the Senate.

The bill provides that all persons holding certificates of competency to act as mine foremen are, by virtue of such certificate, eligible for election to the higher office of mine inspector, in the anthracite district.

The promoters of this bill made an unsuccessful attempt to have its provisions adopted and made a part of the new law recently codified and recommended by the Anthracite Code Commission. Its rejection by the commission, whose prolonged and careful study of anthracite conditions render their conclusions worthy of the utmost regard, makes it difficult to understand the action of the House in this matter.

The present anthracite mining law provides that all candidates for election to the office of mine inspector must pass an examination before the mine inspectors' examining board, which is differently constituted from the mine foremen's examining boards.

The office of state mine inspector is a higher and more responsible office than that of mine foreman; and the examination of candidates for the former has always been of a higher grade than that required to qualify for the latter position. The questions that are made the test of qualification for mine inspectors are not only more difficult, but many of them are of a widely different character, as required by the greater scope of the work.

It is not expected that the upper branch of the Legislature will lend themselves to endorsing the unwise and hasty action of the lower House. The bill passed by the House is a first step in the lowering of the present high standard of the work of the mine inspectors in Pennsylvania. It is an entering wedge to make men eligible for the high office of inspector, who possess only a limited knowledge of the theory and principles on which modern economical mining is based.

The work of mine inspection is one in which theory and practice go hand in hand. The one is as essential as the other. No man, however successful he may have proved as a mine foreman, can make an efficient inspector of mines unless he possesses a thorough knowledge of the theory and principles of mining that he can apply to all conditions.

It would be a miserable mistake to pass such a bill through the Pennsylvania Legislature, and virtually begin to tear down the work of the past twenty years in that state. Education is the recognized leading feature in every branch of industry today, and the examination of all candidates for positions of responsibility is the one sure means of securing the highest efficiency in office, and safeguarding hazardous occupations.

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## The Fuel Well Menace

The fuel-well committee has made its report, but the controversy relative to gas and oil wells in the coal regions is by no means settled. The discussion should continue till more is known relative to earth movements and about the placing of cement mortar or plastic clay in deep and narrow spaces and until careful investigation has confirmed or corrected current notions.

We regarded the suggestions of the Bureau of Mines as marking the minimum requirements of the mining profession. They should have been conceded in full without any abatement or quibbling. Unfortunately the committee undertook to increase the Bureau's concessions to the fuel industry; where the Bureau asked for two casings, the committee concedes but one; where an annular space of four inches was required around the inner casing, the committee reduces it to less than three.

We feel we must warn the fuel-well interests that the public will make unreasonable restrictions on their business in return for their unreason, if any accident occurs. The safest position for any industry to take is that which promises most safety for the public. The pendulum which is held out of perpendicularity on the right is apt to be destructive on the left if once let loose.

The exterior of the couplings in a line of 10-in. casing

exceeds the interior diameter by 1.3 in. so that the clear annular space around the single liner, which the committee provides, is only 2⅓ in. instead of 3 in.

If the gage of the bit is reduced by wear, the hole will be narrowed and the clearance reduced. It will be contended that the driller will not permit such a reduction, that if he allows the hole to be reduced, it will be impossible to get the full sized bit in later. But as a matter of fact as the width of the hole is not to be tested by the entry of casing couplings of equal diameter, there is nothing to prevent the driller from reducing the size of the hole at will, except careful inspection, which is not likely to be exercised.

The contracted character of this annular space increases the probability of air being shut up in the filling material, whether the latter be of clay or of cement mortar. There is nothing to prevent the borehole caving in such a manner, before completion, that the cement or clay will be rendered incapable of implacement by bodies of broken stone made impermeable at their upper surfaces by bodies of clay.

We are sorry that the use of clay is merely an option, and are surprised that the person to whom that choice is left is not anywhere specified. If clay is desirable, caving of the walls of the hole will result in having masses of hard material which will prevent a lateral movement of the pipe to compensate for the motion of the measures. If concrete is desirable, any caving will replace concrete with clay. We are afraid there is little option provided; the failure to provide an outer casing assures the parties interested that the filling will be of a hybrid nature, partly caved, and partly filled material with some of the faults and few of the virtues of either.

It is regrettable that the committee's bill is more liberal to the oil-well interests than the decision of Judge Van Swearinger in the Greensboro Gas Co. case. He required two casings and a hole full 6 in. larger in diameter than the outer diameter of the inner casing.

Argue, contrive and use diplomacy as we will, the last word is never said till safety is secured.

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## A Good Suggestion

The following letter lends support to the arguments so often advanced by COAL AGE, that mining examining boards should give to candidates, in certain sessions of the examination, the privilege of the free use of such textbooks as they see fit to bring with them.

The best material in mining, the strongest and most practical men, are men whose minds have never been trained to remember formulas, constants and other data to be found in all mining handbooks.

It goes without saying that these *handbooks are the necessary tools of every intelligent mine official,* and of none more so than of mine foremen, firebosses and hoisting engineers, who are daily called upon to make calculations, many of which are impossible for anyone, other than a born mathematician, to make without a textbook containing the necessary formulas and data.

Some of our best colleges now allow the use of textbooks, in certain examinations, and this by students with trained minds. The reason for it is educators recognize that in the growing demands and the ever expanding spheres of knowledge much valuable time is lost in students attempting to memorize anything but the most commonly used rules and data. Few college men can extract cube root, today, without their table of logarithms. Why, then, ask practical hard-working men, compelled to pass competitive examinations in order to show their fitness for filling positions of responsibility, to sit in examination under conditions more arduous than those that govern in daily practice?

Here is the letter:

**Please find inclosed 3 units of the great and only "Long Green," for which you will please credit me with one (Great Sun) year's subscription to the Public Forum or that book of yours called "Coal Age." My time is up tonight. Am sorry I did not come across before, but the ghost did not walk till the 28th; so blame it on the company.**

**Now say, Old Cotton, there is just one favor I would like to ask—could you find a little space to put in your book a few formulas, what you think I would need for the examination for mine foreman (anthracite) next month? I can work the problems all right if I can think of the formulas. I mean just a small space, so that a fellow could tuck it in his vest pocket to look at frequently and memorize. If you can do this I shall be much obliged, but if you can't, why it's all right anyway.**

**The book is all O. K. Keep the good work going, and we will all get there—I don't know where, but we are on our way.**

On another page of this issue will be found a brief outline of a plan we have had in contemplation for some time past. Its aim and purpose is twofold: (1) To simplify the calculation of mining problems and provide a practical Study Course for mining students and those preparing for examination. (2) To provide a handy reference book of formulas, data, rules and principles that are constantly needed by mining engineers, mine superintendents, foremen, firebosses, timbermen, trackmen and mine mechanics and electricians.

We hope this handbook, which will be published later as "The Coal Age Pocketbook," will simplify and advance the study of coal mining.

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## Photography in Coal Mining

Some of the larger coal companies having come to realize the importance of visual records in coal mining, have installed complete photographic apparatus at each of their plants.

In case of serious injury to any of their employees, corporations so equipped can immediately secure a view of the particular place where the accident happened so as to verify the engineer's report on the casualty. The plan of having a camera handy makes it easy to show the condition of anything when an explanation regarding it is desired.

In the case of one large company in the Middlewest, the railroad serving the mines asked the coal officials to fill a number of new cars, and load into each as much coal as could be piled on and carried safely to destination without wastage. The desire of the railroad company was to determine the exact capacity of the cars. After the latter were loaded to a safe height, photographs were taken and endorsed on the back with the gross, tare and net weight. It was thus possible for anyone to see exactly how the cars looked when loaded to capacity, and to judge whether they were suitably piled for safe carriage.

It is also a fact that photographs furnish the best means of conveying to anyone the general appearance of coal-company yards as to whether they are dirty or clean. They tell the story better than can be described in writing by an inspector.

# DISCUSSION BY READERS

## Post Timbering at the Working Face

*Letter No. 4*—In regard to timbering the working face in our mines, I do not believe it would be well to have a fixed law or system that would specify exactly how such timber should be set, as the conditions vary constantly. Neither do I think it advisable to have men appointed to visit the working places and timber the same, as this would mean much loss of time to the miners in waiting for the timbermen to reach their places. Every miner ought to be compelled to timber his own place and he should be responsible for keeping his place in safe condition.

In my opinion a law should be passed requiring that all post timber at the working face should have a certain minimum diameter, say 12 in. This would be a heavy timber to handle; but my reason for suggesting it is that a heavy timber will stand more of a blow and will not be knocked out so easily by a shot. Where light timber, say from 6 to 8 in. in diameter is used, the miner will often set up such a post under a stone that he should have taken down. Then, when he fires a blast the stick is knocked out by the flying coal, and when the miner goes back in the smoke he will probably be caught by the loose rock falling on him. The advantage gained, if the law required the use of heavy timber, would be that it would often be easier to take down the stone than to set the heavy timber, and greater safety would result.

When I started to mine coal 35 years ago, we were required to take down any loose rock that was liable to fall. At times we had to take down rock 6 ft. thick and we were allowed so much a ton for it. I believe some such regulation in the anthracite mines would greatly reduce the number of accidents from this cause.

Timber should be cut in the fall when the sap is in the roots. Such timber will not rot as quickly, in the mine, as green timber. To preserve timber, I think a thin solution of well-slacked lime is better than any solution of creosote or other chemical that has a bad odor, as the odor taints the air and is unpleasant to breathe.

When shooting under bad roof, the miner can often drill the hole so that the shot will not be apt to knock out the timber. A miner should be just as careful under a good roof, when the fireboss orders him to stand a prop, to attend to it at once, as delay is often fatal. I believe it would be better for the company to pay a miner for taking down a bad section of roof instead of attempting to prop the same.

THOMAS R. PIERCE, Miner.

Scranton, Penn.

*Letter No. 5*—The matter of timbering the working face should have first attention. The miner should set his posts before starting to load out his coal. Post timber should be set plumb with a heavy cap-piece over the post so as to cross any slips in the roof. The large end of the prop should be up. In my experience, I have found that a post stood with its large end up will bear a greater load than one stood with the small end up.

It is important that the cap-piece should be of softer wood than the post itself, so that when the weight comes on, the cap will bind the head of the post together. When both a cap and a wedge are used the wedge should be driven between the cap and the head of the post, and not between the roof and the cap. In this case, the cap may be of hard wood and the wedge of softer wood.

I have had six years' experience as mine foreman in the No. 8 Pittsburgh seam, and during that time have had but one man hurt by accident other than by a fall of slate at the face. In No. 8 seam, there is a drawslate averaging from 12 to 15 in. thick, which the miner tries to hold up for three or four yards at the face, to give him an opportunity to load out his coal before dropping the slate. In this way we have had more men hurt in the mine, than from any other cause.

The best plan, in No. 8 seam, in posting this drawslate, is to set the posts 4 ft. apart each way so that they will form a triangle. Large caps, say 3 ft. long, if necessary, should be used, pointing toward the face. The caps should always point toward the face, unless it is necessary to point them in another direction in order to cross the slips in the roof. Too small a wedge or cap-piece will often cause a post to "trip" and they do not give the proper support across the slips or breaks, which makes their use dangerous. If miners would be more careful to use good wedges and long caps under a roof stone or slate, at the face, it would greatly reduce the number of accidents.

It is always important that a post should be set so that the weight comes directly over the post; otherwise, the post may "trip" and the cap be broken. Where the bottom is soft, a mudsill should be used; and this should not be less than 10 in. wide, 18 in. long and 4 to 6 in. thick. In some cases, a larger and heavier sill will be required to give a suitable foundation to the post. The system of timbering will necessarily depend on the conditions at the working face. In many cases, it is necessary to set the posts in rows parallel to the face. Sometimes, four rows of posts will be necessary, the rows being only 2 ft. apart, while the posts are 4 ft. apart in each row. This method throws an equal weight on each post and greatly strengthens the roof.

MICHAEL FREEMAN, Mine Foreman.
Glendale Coal Co.

Glendale, W. Va.

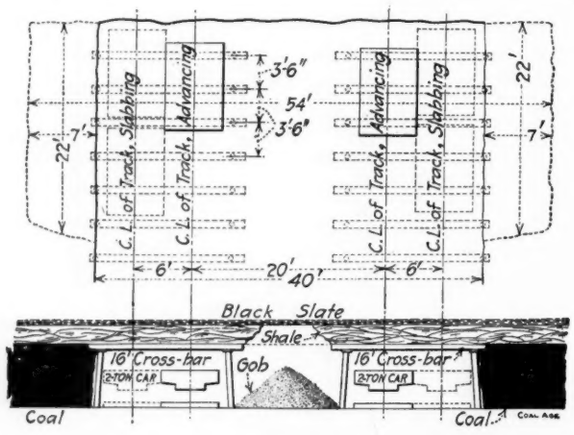
*Letter No. 6*—The following brief description, together with the inclosed drawing, shows a new method of working I have inaugurated in this district. The whole plan depends on the special style of timbering adopted, which, therefore, will be of interest in this discussion.

The method of timbering I am about to describe is used to mine a 6- or 7-ft. seam of coal, overlaid by a bench of shale varying in thickness from a few inches up to 3 ft. The cover above the shale is nowhere thicker than 80 ft. and often less than 25 ft. The stratum immediately above the shale is a hard black slate that breaks

easily. The roof shale, if not supported, will stay in place but a few days, a couple of weeks at the most, after the coal has been removed. It weathers rapidly when exposed to the air, detaching itself in large slabs measuring sometimes 3 or 4 sq.yd. and only 5 or 6 in. thick.

The rooms are driven 40 ft. wide, with two loading tracks spaced 20-ft. centers. The roof is supported by crossbars spaced 3½-ft. centers. One end of each crossbar is "hitched" into the coal, while the other end rests on a prop so placed as to clear the mine cars by at least 8 in. This has been found amply sufficient to hold the roof. The coal is undercut 7 ft. deep by electric-chain machines. After the room is driven up to the assigned limit, the miner starts what is called "slabbing"; a 7-ft. slice being taken off each rib.

Starting at the face, the machine makes a cut extending outward under six crossbars. This is plain sailing, as there are no props in the way. But, as soon as the cut is done, the timbermen set a prop under each crossbar, leaving a space of not less than 8 in. between the rib and




PLAN AND CROSS-SECTION OF A 40-FT. ROOM, SHOWING METHOD OF REMOVING PILLARS BY "SLABBING"

the prop. The timbermen then shift that part of the track which is opposite the newly made cut, 6 ft. toward the rib. The work is done in a very short time with ordinary crowbars and without disconnecting any rail joint. The slab is then bored and shot by special men before the loaders come to work.

The shooting seldom knocks down a prop, so accustomed to the work have the men become. If, however, a prop is either knocked down or moved, it is immediately reset. When the loaders come to work, in the early morning, they at once set themselves to dislodging and shoveling the coal. It would seem, and for a time, it certainly did seem to me, that the distance between the props was too short to permit of quick work on the loaders' part. But, after the men got accustomed to the work, the thing proved a great deal easier than was at first anticipated.

The first slab cut is started at the face of the room and consequently, both ends of it are fast. This is the case shown in the figure. But the next cut will have one loose end—the upper or inside one. The lower or outside end of the cuts will, of course, always be fast; but it is a matter of only 30 min. work for two men to make an opening there. When this has been done, the work progresses rapidly. In slab work, four men work together, and two mine cars are set out for them every time a change of cars is made. After a slab-cut is loaded out and before another cut is started by the machine, the timbermen remove all props and crossbars they can take out without exposing themselves, always stopping at the last set of timber, above the lower end of the cut where the coal has just been loaded. This set they leave for the present. The timbermen are careful to remove also the upper end of the track that has now become useless.

It has been found practicable to save six props out of ten, and about the same proportion of crossbars. It has always proved easy to knock down any standing props that it was thought too risky to attempt to save. This allows the falls to take place more easily. The space left open is only 54 ft. wide, but it falls nicely, in a few days. The caves appearing on the surface are so neatly and definitely cut, that a map of the workings could be made from them without the surveyors going underground.

F. C. CORNET,
Mining Engineer.

Charleston, W. Va.

*Letter No. 7*—Timbering at the working face is, I believe, one of the most important subjects connected with mining, and, at the same time, the work most neglected by the miners. The disregard of miners for their own safety is the most serious problem with which mine officials have to contend. Many mine officials fail in their duty by not requiring of each miner the proper timbering of his working face, at the proper time. As a consequence, we are losing more lives from falls of roof slate and coal than from all other causes combined.

The question is, what can we do to reduce the number of accidents from this cause? I am a firm believer in *systematic timbering*. Any kind of a *system* is better than none. I am also convinced that the miner is the proper person to do the timbering, except in some special cases that require the skill of experienced timbermen, employed for that purpose.

The miner should understand the necessity of setting a post, at the proper place and time; if he does not, he should be instructed along these lines. On the other hand, if he had to wait till men employed to do the posting arrived, he would too frequently take chances and load an extra car of coal, which, in past experience, has often proved to be the fatal car. Accidents from this cause will continue as long as the negligence of the miner is allowed to prevail.

In my experience, the best results have been obtained by adopting and enforcing a certain system of posting, more or less adapted to the conditions. Then, satisfy yourself that the miner thoroughly understands it and hold him directly responsible for the proper performance of the work. I am of the opinion that systematic timbering, in one form or another, will cover most of the conditions in coal mines. It may be, of course, necessary to have different systems to cover different conditions, in different mines, or in different sections of the same mine. In the various systems that I have recommended, I have only given the *minimum* amount of posting required or, in other words, the *maximum* distance apart of the timbers, which would not prevent intermediate posting should the case require. By so doing the miner or the official will always have to keep within this limit in setting posts. In case the rule is violated by setting post timber farther apart, an example should be made of the person or persons at fault.

My remarks and rules are particularly adapted to the Pittsburgh coal seam; but the same rules can be modified so as to apply to similar seams and conditions in other mining districts. The accidents from falls seem to be on the increase, so that about twelve of the bituminous-mine inspectors, I being one of the number, met early in 1910, and after several meetings and much discussion, adopted a system of posting the drawslate in the Pittsburgh coal seam, which posting is temporary while the miner or loader is loading out the coal from under the slate. This system was shown and fully described in COAL AGE, Vol. 2, p. 258.

We also adopted seven rules for timbering, which are particularly adapted to the Connellsville coke region, but will meet the requirements in seams of coal where conditions are similar. I give them here for the benefit of the reader:

**Rule No. 1**—In all rooms, entries, cut-throughs and chutes, exceeding 10 ft. in width, posts must be set nearly at right angles to the pitch of the seam, with good cap-pieces and in a straight line as near the center of the place as practicable. The distance between centers must not exceed 4 ft. 6 in., and the distance between the last post and the working face must not exceed 6 ft., except in places being undercut by machine, when the distance between the last post and the face may be such as the mine foreman, using sound judgment, may deem necessary for the safety of the workmen.

**Rule No. 2**—Where roof conditions necessitate the use of crossbars, no room, entry, cut-through, or chute shall exceed 10 ft. in width, except where special requirements render a greater width necessary. All crossbars must be properly and securely set, the distance between centers not exceeding 4 ft. and the distance from the last crossbar to the working face must not exceed 5 ft. We advise the use of temporary center posts, with good cap-pieces, to be set between the last crossbar and the working face, until another crossbar has been set, or until the loose coal or slate is taken down, as the case may be.

**Rule No. 3**—In all places after a blast has been fired, the roof and timber must be carefully examined by the workmen before they start to work, and any displaced timber must be promptly placed in position.

**Rule No. 4**—In the removal of pillars, the timbering should be done in a systematic manner. The distance between posts and between rows of posts must not exceed 4 ft. 6 in., and they must be set nearly at right angles to the pitch of the seam, with good cap-pieces and in parallel lines as close to the working face as practicable, maintaining a sufficient number of rows to insure the roof being kept in a safe condition until the posts are withdrawn.

**Rule No. 5**—In cutting across ribs or pillars where their thickness requires track across the working face, posts should be set on each side of the track, in the manner described in Rule No. 1 or Rule No. 2, according to the nature and condition of the roof.

**Rule No. 6**—In all cases when the coal is removed and the gob exposed, a line of posts shall be set near its edge. The distance between such posts or between the posts and the coal must not exceed 4 ft. 6 in.

**Rule No. 7**—In the removal of posts or timber while making rib-falls, none but competent workmen shall be permitted to perform the work.

You will understand that the system described in the above rules gives but the minimum amount of posting required and is not to be understood as forbidding intermediate posting or the adoption of additional precautions that circumstances may render advisable; nor as permitting you to omit such additional precautions if circumstances should render them reasonably necessary; nor does it permit you to neglect the rigid enforcement of any of the provisions of the mining laws pertaining to the prevention of accidents.

In order that these rules may be fully and carefully carried out and in order that the desired results may be secured—the prevention of accidents from falls—we would respectfully recommend a more rigid and frequent inspection, by mine officials, of all working places, roadways, etc.; because we are decidedly of the opinion that by exercising good judgment and strict discipline in the enforcement of these rules, there will be a very material decrease in the number of both fatal and nonfatal accidents from falls in the mines under consideration.

In mines where the coal is undercut, in wide rooms, by mining machines, the coal should not be blasted until the roof is posted within 6 ft. of the face. The blast many times causes a sag in the roof, and a number of accidents have resulted therefrom, that could have been avoided by setting timbers to prevent this sag.

In timbering, in pillar work, the cap-piece should be directed toward the fall or gob, and wedged in the same direction, so that when rock presses against the post from the side of the gob, it will tend to tighten the post instead of knocking it out. Accidents, both fatal and nonfatal, have resulted from the failure of properly wedging a post, on pillar-work.

The ordinary posting of a room should be carried out on a system best adapted to the particular locality in which the mine is located, and which past experience has proved adequate.

F. W. CUNNINGHAM.
Mine Inspector, 21st Bituminous District.
Charleroi, Penn.

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## Self Education of Miners

To become a fireboss is the ambition of many miners. It is the stepping stone to something higher. The general run of miners and men employed in and around the mine began work at an early age and, as a result, many have considerable less than a common-school education.

When a man has attained his first position as fireboss he begins, if he is ambitious, to educate himself and make up for his lack of schooling. While acting as fireboss, if he makes the most of his spare time, studying a few hours a day, he can soon master any line of study that interests him. If he does not want to follow up mining, there is no necessity to do so.

The usual hours in which a fireboss must do his work makes it possible for him to devote much time to study. He starts out between one and two o'clock a.m. in order to be at the mine and ready to begin his examination at three. He returns home about noon, tired and hungry. But, after washing up and eating his dinner, he can often utilize an hour or so to good advantage as no one should go to bed immediately after a hearty meal.

If he is wise he will begin to study the common-school books first, such as arithmetic and spelling, and apply these to his daily work or the work he wants to follow. A little study along these lines each day will soon give him a broader view of life and a broader mind. But a man who makes no effort to improve his position or broaden his mind, will sooner or later have to step aside to make room for a more earnest, eager and deserving man who will take his place.

A. F. DICKSON.
Roscoe, Penn.

[We are glad to indorse these brief remarks of our correspondent, drawing attention to the many opportunities that mine workers *can* improve if they *will*. The man who toils with his hands, during 8 or 10 hours of the day, and devotes the balance of the 24 hours to recreation and rest, often thinks his time for study is less than that of the office worker. It proves the old maxim: "Distance lends enchantment to the view." Office men, who must often toil 16 and 18 hours of the day, have learned the value of spare moments that are so generally wasted by other toilers.—EDITOR.]

# EXAMINATION QUESTIONS

## Fan Ventilation

*Ques.*—What would happen to a mine-ventilating fan if the doors at the top of the upcast shaft were suddenly opened; would the fan stop, slow down, or increase in speed? Give reasons for your reply.

*Ans.*—If the doors at the top of the upcast shaft were suddenly opened (assuming, of course, that the fan is exhausting the air from the mine), the mine would be cut off from the action of the fan, the air current being short-circuited at that point and passing directly from the outside atmosphere into the fan drift and through the fan from which it is then discharged through the expanding chimney into the atmosphere again.

This cuts out the mine resistance, which always opposes the circulation of the air; and, as a result, a very large volume of air enters and passes through the fan, greatly increasing the work lost or the power absorbed by the fan. Assuming the power applied to the fan shaft remains constant, the effective power causing the circulation of air would be very much decreased. It is this effective power that turns the fan; and, under the conditions just named, the fan would run slower but would, as stated, pass a larger volume of air per minute.

*Ques.*—When do the workings of a mine give off the most gas, when the fan is running or when it is stopped?

*Ans.*—The answer to this question depends wholly on conditions not named in the question. For example, assuming, first, that the conditions in the mine remain unchanged with respect to the emission of gas from the coal and other strata, if the fan is a blower, the mine pressure will be reduced by stopping the fan, and the outflow of gas from the strata will be increased. On the other hand, for the same conditions in the mine with respect to the emission of gas from the strata, if the fan is exhausting air from the mine the mine pressure will be increased when the fan is stopped, and the outflow of gas from the strata will naturally be less than before.

There are other conditions, however, affecting the outflow of gas from the strata, which produce a far greater effect on the outflow of gas into the workings than that produced by the stoppage of the fan whether blowing or exhausting. The emission of gas from the strata is not regular, but increases or decreases, from time to time, according to conditions existing in the strata itself. There are periods when the outflow of gas from the strata is abundant and, again, it will almost cease for a time. Besides these conditions existing within the strata, the advance of the working face and the extraction of the coal open new feeders of gas continually. Owing to these conditions, no definite answer can be given.

*Ques.*—A fan 15 ft. in diameter, working alone, produces 40,000 cu.ft. of air per minute, under a water gage of 1.06 in., giving an efficiency of 50 per cent. At a distance of 4000 ft. from this fan and on the same entry, another fan is placed and driven by a 25-hp. motor. The efficiency of this second fan is such as to make available 60 per cent. of the power applied. What will be the quantity of air and water gage produced when both fans are running?

*Ans.*—This is one of those unintelligible questions to which no answer can be given that would be of any practical value. If it were possible to introduce another motor of a given power, into an air current circulated by a given motor, in the same manner as it is possible to increase the power moving a train of cars, at any point of the train, the increase of air or the quantity in circulation could then be calculated, assuming the quantity proportional to the cube root of the power applied to move the air or the effective power on the air. The effective power or power on the air, in the first instance, is

$$H = \frac{40{,}000 \times 5.2 \times 1.06}{33{,}000} = 6.68\ hp.$$

In the second instance, the effective horsepower is increased by the effective power of the second motor, which is 25x0.6 = 15 hp., which makes the total effective power or the total power on the air 6.68 + 15 = 21.68.

Then, if the quantity of air in circulation varies as the cube root of the power on the air, the quantity ratio will be equal to the cube root of the power ratio. Or, calling the required quantity of air in circulation, $x$,

$$\frac{x}{40{,}000} = \sqrt[3]{\frac{21.68}{6.68}} = 1.48$$

$x = 40{,}000 \times 1.48 = 59{,}200$, say 60,000 *cu.ft. per min.*

Then, since the water gage varies as the square of the quantity of air passing, the increased water gage will be

$$w.g. = 1.06\left(\frac{60{,}000}{40{,}000}\right)^2 = 1.06\left(\frac{3}{2}\right)^2 = \frac{1.06 \times 9}{4} = 2.385\ in.$$

The conditions, however, that exist in the mine, with respect to these two ventilators, make this solution very problematic.

*Ques.*—A fan, 12 ft. in diameter, having an equivalent orifice of 30 ft., is running at a speed of 90 r.p.m. If the equivalent orifice of the mine is 19 sq.ft., what is the manometrical efficiency of the fan and what is the quantity of air this fan should deliver.

*Ans.*—It is necessary, first, to calculate the value of the manometrical efficiency of this circulation, from the given values of the equivalent orifices of the fan and mine, respectively. This efficiency is the ratio of the square of the equivalent orifice of the fan to the sum of the squares of the orifices of the fan and mine. Thus,

$$K = \frac{O_f^2}{O_f^2 + O_m^2} = \frac{30^2}{30^2 + 19^2} = \frac{900}{1261} = 0.7137$$

The quantity of air circulated by this 12-ft. fan, running under a speed of 90 r.p.m., in a mine having an equivalent orifice of 19 sq.ft., is then calculated thus:

$$Q = 3\ O_m D n \sqrt{K} = 3 \times 19 \times 12 \times 90 \sqrt{0.7137}$$
$$= 52{,}000\ cu.ft.\ per\ min.$$

This style of question depends on the correct determination of the equivalent orifices of the mine and fan, respectively, which is a difficult matter.

# Study Course in Coal Mining

By J. T. Beard

The demand for increased efficiency grows steadily in every industry, and in none is this demand greater, today, than in coal mining. The shortest road to efficiency is the *education of the workers.*

Large industries and corporations employing workers in every capacity; have long since felt the need of increased efficiency of the workers in the mine, the shop and the field. To meet this growing need, many of the larger companies have organized special training schools and classes for their employees and the progress of students is rewarded by the advancement of those who prove their fitness for the work.

The work done in this direction by several of the large coal companies has produced commendable and gratifying results. Mine workers today recognize more than ever what proper training and education can do for the man who has them. The evidence of this fact is shown by the number of ambitious mine workers who are anxious to study.

The cry that comes to Coal Age from these men is for "something simple—something that a man of little schooling can study and understand." The cry is pathetic when we reflect that these men must study while they work. Others of their number, with an overmastering ambition to learn, rob the much-needed hours of rest and burn the midnight oil while the family sleeps.

In response to repeated requests from readers—miners, mine officials and engineers—for the publication, in tangible form, of reliable formulas and rules used in calculating all kinds of mining problems, the editors of Coal Age have decided, after carefully considering the needs of these different classes of men, to publish each week one or more pages of useful formulas, constants, tables, etc., together with practical rules, examples and brief, clear explanations of important principles in coal mining.

This will appear each week under the title, Study Course in Coal Mining. The matter will be published in page form, as shown by the two pages printed below. The size of these pages, 3x5 in., will make them available for compiling later in book form, which will be done as soon as a suitable number of pages have been completed, to make a useful handbook.

The book will be published as The Coal Age Pocketbook and will be as complete a reference book for coal men as it is possible to make it. To this end the editors of Coal Age invite suggestions from all their readers.

The subjects treated will cover every branch of coal mining, but will give only what is most essential, avoiding duplications, and all unimportant matter. The pages will be complete in themselves, but will follow no regular order, as they first appear. In the later publication, they will be classified and indexed.

## The Coal Age Pocketbook

### AIR

**Composition—**

| | *By Volume* | *By Weight* |
|---|---|---|
| Oxygen, | 20.9 *per cent.* | 23.0 *per cent.* |
| Nitrogen, | 79.1 *per cent.* | 77.0 *per cent.* |
| | 100.0 | 100.0 |

Air also contains 0.04 per cent. of carbon dioxide ($CO_2$). Average mine air seldom contains less than 20 per cent. of oxygen, unless the air is diluted with other gases generated in the mine.

**Quantity of Oxygen Consumed in Breathing**—A man at rest consumes 263 c.cm. of oxygen per min., or 263 × 0.06102 = 16 cu.in. per min. and exhales an equal volume of carbon dioxide. Air exhaled from the lungs contains 2.6 per cent. carbon dioxide, 18.3 per cent. oxygen, 79.1 per cent. nitrogen.

In violent exercise, a man consumes from eight to nine times the amount of oxygen required when at rest; or, say 128 to 144 cu.in. per min. The exhaled breath may then contain 6.6 per cent. carbon dioxide and only 14.3 per cent. oxygen.

**Depletion of Oxygen in Air, Effect on Life**—Air containing 3 per cent. carbon dioxide can be breathed without discomfort, even when the oxygen content has been reduced to 16 per cent.; but 5 per cent. carbon dioxide causes headache, dizziness and nausea, after a short time.

When no carbon dioxide is present in the air the oxygen content may fall as low as 14 per cent. before much difficulty is experienced in breathing; but air containing but 10 per cent. is no longer breathable; but will cause death quickly by suffocation.

**Weight of Air**—The weight of air, for the same volume, varies directly with the pressure it supports, and inversely as the absolute temperature. There are two formulas for finding the weight of 1 cu.ft. of air, one in terms of the barometer (B), in inches, and the other in terms of the pressure (p) in pounds per square inch.

By the barometer,

$$w = \frac{1.3273\,B}{460 + t}$$

By the pressure,

$$w = \frac{p}{0.37\,(460 + t)}$$

## The Coal Age Pocketbook

### WATER

Water is a liquid; practically incompressible; freezes at 32° F. (0° C.); boils at 212° F. (100° C.), at sea level.

Decrease of pressure lowers the boiling point.

Increase of pressure raises the boiling point.

Elevation 10,000 ft. above sea level; pressure = 10.1 lb. per sq.in., water boils at 194° F.; but in steam boilers, under 150 lb. gage (150 + 14.7 = 164.7 lb. absolute pressure, sea level) the temperature of the water is 366° F.

**Density of Water**—Although water is practically incompressible, its density and, therefore, its volume, does change slightly with the temperature. Water reaches the point of maximum density at 39.2° F. (4° C), and expands in freezing at 32° F. It is this expansion in freezing that bursts water pipes and disintegrates porous rocks saturated with water. Taking the maximum density of water as unity, the relative density at any absolute temperature T is calculated by the formula

$$D = \frac{1000\,T}{500^2 + T^2}$$

**Water as a Standard**—Pure distilled water is an important standard in many ways. The melting point of ice being more uniform than the freezing point of water, is taken to mark the zero of the Centigrade and Reaumur thermometer scales or 32° F.; while the boiling point, at sea level, marks 100° C., 80° R. and 212° F.

As a standard of weight, the weight of water (max. density) is taken as unity or 1, and the weights of equal volumes of other liquids and solids are referred to this standard by what is called the specific gravity of the substance. Thus, the average specific gravity of anthracite coal is 2.5, which means that this coal weighs 2½ times as much as water, volume for volume.

As a standard of measure, 10 lb. of water was, at first, adopted as the English gallon. In the metric (French) system, 1 kilogram of pure distilled water (max. density) = 1 liter (cu.decimeter).

As a standard of pressure or measure of pressure, the height of water column supported by the pressure is used to measure the pressure per unit of area . Thus:

**In pumping:** 1 *ft. water column or head* = 0.434 *lb. per sq.in.*

**In ventilation:** 1 *in. water gage* = 5.2 *lb. per sq.ft.*

# SOCIOLOGICAL DEPARTMENT

## The Financial Outlook of a Frick Employee

By Thomas W. Dawson*

*SYNOPSIS—The H. C. Frick Coke Co. provides free insurance to all its employees, the maximum payment being $3000 in case of death. Pensions are paid to the old and incompetent. The company is endeavoring to enable the employee to increase his earnings by increased output and to conserve them by investment in U. S. Steel Corporation stock.*

The H. C. Frick Coke Co. has not restricted its work to protection against accidents, but provides a plan whereby those who are injured, or whose relatives are killed, may be provided with a livelihood.

The plan of relief in case of death or accident was put into operation May 1, 1910, and was tried for one year to determine its success. It is purely voluntary, and was established by the company for the benefit of all employees injured, and for the families of all workmen who might happen to be killed in the service of the company. There is no contribution whatever from the employees. The principal features of this plan are that relief is paid regardless of legal liability, and without any legal proceedings. Even application for relief is not required.

The company provides treatment by surgeons and hospitals. No relief is paid for the first 10 days of disability, such restriction having been found necessary in all legislation on the subject. In case of accident, single men who have been in the employ of the company five years or less are paid 35 per cent. of the daily wages received at the time of accident, and an additional 2 per cent. for each year of service over 5 years. Married men in the service of the company for five years or less receive 50 per cent. of their daily wages at the time of accident, with 2 per cent. additional for each year of service, and 5 per cent. additional for each child under 16 years of age. The maximum payment is fixed at $2.50 per day and for the loss of a hand 12 months wages; of an arm, 18 months; of a foot, 9 months; of a leg, 12 months; and of an eye, 6 months wages.

For death by accident the company pays reasonable funeral expenses, and the widows and children of men so killed receive relief equal to 18 months wages of the deceased if in the service of the company five years or less, with an addition of 3 per cent. for each additional year of service above five years. An additional 10 per cent. is added for each child under 16 years of age, the maximum being fixed at $3000.

When the plan was put into effect, it was printed in the various languages and a copy given to each employee. One is now given to every arrival as he goes to work.

### Pensions for the Old and Those No Longer Competent

The United States Steel Corporation, of which the H. C. Frick Coke Co. is a subsidiary, has provided $8,000,000, which, with the Carnegie Relief Fund, created by Andrew Carnegie on Mar. 12, 1901, makes a joint fund of $12,000,000, in which the employees of the H. C. Frick Coke Co. participate. Its principal features are; compulsory retirement for men at 70 years of age after 20 years of service; retirement at the request of the employee, or his employing officer at the age of 60 after 20 years of service; retirement by reason of permanent total incapacity after 20 years for a man under 60 years of age.

The basis of the pension scheme is; first, for each year of service, 1 per cent. of the average monthly earnings for the last 10 years of service; second, credit for service rendered to any of the plants of the subsidiary companies of the United States Steel Corporation, or to the predecessors of such companies; third, a minimum pension of $12 per month and a maximum pension of $100 per month.

Thus it has been seen that the company in the first place leaves nothing undone to protect its employees from injury, that when injured, as some of them are bound to be in the operation of some 65 mines, everything possible is done for their care and treatment; financial provision made for them and their families, and in case of death, for their widows and children; and when old age comes after years of service, the employees are assured sufficient income to take care of them to the end of their days. Thus, while conducting the great business done by the H. C. Frick Coke Co., it ever keeps in sight that one great factor "the employee."

### Interest in Raising the Earnings of the Employees

The company has done much to increase the efficiency of their employees and to assist them in making the highest earnings possible under the contract prices. The company pays the highest wage in the region, and has always been foremost in increasing it when justified. It has established a standard efficiency basis, indicating what each employee, no matter what is his job, should accomplish for a day's work. This standard is not based on what the most capable man can do, but on the strength and endurance of the average man.

Daily reports are made showing the efficiency of each group of employees, setting forth the work performed by those mining or hauling coal, laying track, setting timber, etc. To aid the miner to earn all he can, steel track is used in headings and rooms, instead of the former wood track, on which the mine car can be far less easily moved. Haulage partings are continually moved up to the working sections. Empty cars are supplied to the miner as fast as he needs them, being delivered to the face

*Assistant chief engineer, H. C. Frick Coke Co., Scottdale, Penn.

Note—Abstract from paper entitled "Welfare, H. C. Frick Coke Co.," read before the winter meeting of the Coal Mining Institute of America.

of his working place. All loaded wagons are promptly removed.

General Rule No. 18 requires that: "Superintendents and foremen shall see that the turns are fairly distributed among the workmen on contract or piecework, and that no more men are employed than are absolutely necessary to perform the required amount of work well, and at the proper time."

Rule No. 21 states that: "Superintendents must pay strict attention to the rights and privileges of all employees, hear and give prompt attention to any reasonable complaint or claim for redress made by any employee, and not allow any discrimination on account of nationality or creed."

Where the working sections of a mine are a considerable distance from the entrance or shaft bottom, workmen are transported on "man trips" to and from a point near their work, thus eliminating the expenditure of a vast amount of energy which would be required in walking to and from their working places.

### Inducements Offered for the Saving of Wages

Each year the employees of this company are offered stock of the United States Steel Corporation upon easy and especially favored terms which involve benefits beyond those granted to the ordinary stockholder. Of recent years the stock allotted has been over-subscribed. The figure charged is the market price or a little less, usually the latter. The minimum payment is $2 to $3 per share for preferred, varying in accordance with the price of the stock, and $1.25 to $1.50 for common stock.

The maximum which can be paid is 25 per cent. of the monthly earnings. A payment of $5 for preferred and $3.50 for common per annum for five years is paid on each share of stock purchased by employees under this plan. Non-paid-up subscriptions can be cancelled and the money paid in is refunded to the employee with 5 per cent. interest.

Premiums are not paid to employees who cancel subscriptions, sell their stock or leave the employ of the company, and the forfeited or unpaid premiums are kept in a fund and divided pro rata among the remaining stockholders under this plan at the end of the five years. If death occurs to an employee who has subscribed for stock and made payments under this plan, his estate receives the unpaid premiums for the full five-year period and a pro rata of the undivided premium at the time of death.

## A Uniform Danger Signal

By L. R. Douglas*

During a discussion on the fencing off of bodies of gas, or other dangerous places, at a recent meeting of the Trinidad Chapter of the Rocky Mountain Coal Mining Institute, reference was made to a danger signal of some kind. Also a clause in the proposed mining laws for the state of Colorado alludes to a uniform danger signal. It is highly important that whatever warning device is used, should be uniform throughout the district. The majority of our miners today are foreigners, and unable in most cases to read the English language.

In the southern Colorado coal fields, where the mines are close together, it is common practice among the men to keep changing from one place to another. Wherever they would go the uniform danger signal would convey to them the same meaning, for the reason that it would look just the same as the sign they learned meant danger at the first or last place at which they were employed. Since "Safety the First Consideration" is the slogan now adopted by all operators, it seems that the uniform danger signal would be an additional step in this direction.

An efficient and serviceable signal is shown in detail by the accompanying sketch. It should be of No. 24 sheet tin, 12x14 in., with beaded edges, a wire being strung

Danger Sign

through the bead, and looped at each corner. The diameter of the loop should be about ¼ in., making it easy to hang up. The background should be enameled red, and the border around the word "Danger," and the letters should be white.

This would form a striking signal, and one not affected by water or humidity in the atmosphere. The enameled surface can be readily cleaned of dust and grease, with a piece of waste or cloth. This sign being durable and easily made, is presented to the mine operators for their consideration.

## First Aid Demonstration of Pittsburgh Coal Co.

By H. G. Adamson*

On Thursday evening, Mar. 5, the Pittsburgh Coal Co.' first-aid teams in the Thoms Run district, gave their first competitive exhibition in the hall of the Knights of Pythias, at Federal, Penn. The three teams composing the organization were dressed in new white uniforms having a red cross on the left sleeve and these suits gave the contestants a neat and military appearance. The classes had been thoroughly instructed and drilled by Dr. Rittenhouse, of Federal, Penn.

An audience estimated at 500 persons witnessed the contest and many late arrivals were unable to secure admission to the hall. Among the visitors were several of the officials of the Pittsburgh Coal Co., including J. M. Armstrong, manager of mines, F. C. Fritchman, assistant manager of mines, J. M. Sloan, district superintendent, J. E. McDonald, superintendent of the relief department, Dr. Kennihan and Mr. Judd, also of that department.

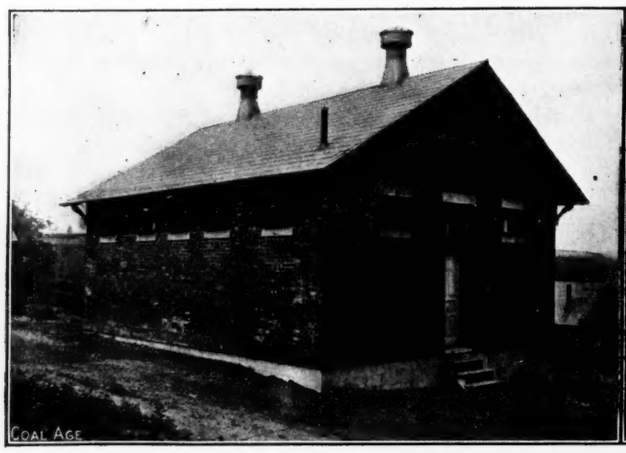
The mothers, wives, fathers, brothers and sisters awakened to a realization of the fact that the men who are members of first-aid teams will help materially all the mine employees in the district. One feature that the company and its local officials much appreciate, is that a number of those who attended the exercises for the first time, expressed their desire to become members of the first-aid teams.

The company has furnished a hall at Federal, Penn., centrally located, and it is fitted with first-aid charts and a skeleton for the benefit of all the employees who wish to avail themselves of first-aid instruction. The classes meet once a week.

*Assistant engineer, Danford & Sanderson, Trinidad, Colo.

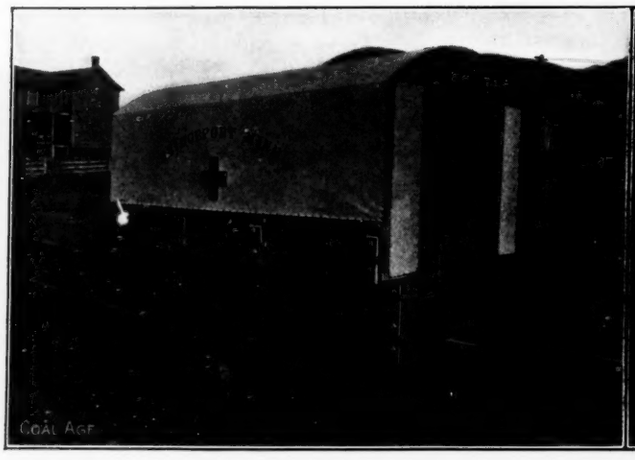
*Burdine, Penn.

# Views of H. C. Frick Coke Co. Welfare Work




EXTERIOR OF BATHHOUSE AT COLLIER, SMITHFIELD P. O., FAYETTE COUNTY, PENN.

INTERIOR OF THE COLLIER BATH AND CHANGE HOUSE, SHOWING SHOWER COMPARTMENTS




AN UNDERGROUND AMBULANCE CAR FOR USE ON MINE TRACKS, BRIDGEPORT MINE, FAYETTE COUNTY, PENN. COAL 6 TO 8½ FEET THICK

FIRST-AID TEAM AT PHILLIPS MINE, WHICH WON FIRST PRIZE AT NINTH INTERNATIONAL RED CROSS CONFERENCE, WASHINGTON, D. C.

A SAFETY SHAFT-GATE LATCH, WHEN CAGE IS NOT AT LANDING, LATCH WILL NOT OPEN. GATE REMOVED TO SHOW MECHANISM

SAME SAFETY DEVICE WITH LATCH OPEN. THE CAGE HAS RISEN, AND ACTING AS A FULCRUM HAS PERMITTED CAGER TO OPEN GATE

# BOOK REVIEW DEPARTMENT

BRITISH COLUMBIA BUREAU OF MINES, BULLETIN NO. 1, 1913. PRELIMINARY REVIEW AND ESTIMATE OF MINERAL PRODUCTION, 1912. By Wm. Fleet Robertson, provincial mineralogist. Paper, 7x10 in.; 29 pages.

The bulletin has been prepared before the receipt of the official reports of the gold commissioners and mining recorders of the Province, for the year 1912; and before receiving the usual returns made annually by the managers of mines and reduction works. In estimating the net production for 1912, the bulletin has made allowance for a possible slight reduction in the total final figures, to be received later.

It is estimated that the coal mines of Vancouver Island have produced during the year 1,553,000 tons; those of the Crowsnest district 1,299,000 tons; while those of Nicola and Similkameen have produced 214,000 tons. Of this coal production 393,000 tons were made into coke, the coking operations being confined entirely to the Crowsnest district which fact reduces the production of coal in that district to 904,000 tons, net. The bulletin gives a brief summary of the important mining developments in the Province, during the year.

EINFUHRUNG IN DIE MARKSCHIEDEKUNDE MIT BESONDERER BERUCKSICHTIGUNG DES STEINKOHLENBERGBAUS. (An introduction to the study of subterranean surveying with particular reference to coal mines) by L. Mintrop, teacher at the Bochum Mining School. 209 pp. with index. 6¼x9⅜ in. 191 ill. and 5 double-page plates. Julius Springer, Berlin, 1912.

The title of this book sufficiently defines its character, and the author's standing proclaims its reliability. The discussion covers land surveying, the instruments used above and below ground and their use, and the estimation of areas and earthwork.

A few useless traverse tables are given, which are carried down only to even degrees, even meters from 1 to 10 and two places of decimals. We can hardly see what use these would be, even in a classroom. The plates are interesting and suggest that the German coal mines are not operated without considerable difficulty.

COAL MINES REGULATION ACT, 1911—HOW TO REMEMBER IT—Arranged by Henry Davies, director of mining instruction for the County of Glamorgan, Wales. 120 pp. 5⅜x8¼ in. Thos. Wall & Son, Ltd. Wigan, England. Cloth boards. Price, 1/6.

The writer of this book has taken the British mining law and rendered it into everyday English, giving each subject a bold and easily visible title. Moreover, the information is alphabetically arranged so that ready reference can be made to any part of the contents. It would be well if a book, following a somewhat similar method and containing the various state laws, were printed in this country.

It is probably well known to our readers that Great Britain is governed by both laws and Home-office orders. Several of the latter relating to coal mines are included in this book and also the Coal Mines (Minimum Wage) Act. This book is both cheap and handy, and should obtain a ready sale.

ANNALES DES MINES, RECUEIL DE MEMOIRES SUR L'EXPLOITATION DES MINES, Vol. III, Series XI, 1913. H. Dunod et E. Pinat, 47 & 49 Quai des Grands-Augustins, Paris; 5¾x9. Paper.

This edition of the Annales contains a study on magazines containing black powder, by M. Saladin, chief engineer of the Schneider establishments, representing the committee on iron works and iron mines in Meurthe et Moselle, and M. H. Dautriche, chief engineer in control of powders and saltpeter.

It may be well here to quote the conclusions at length:

1. In case of an explosion in an underground magazine or one built on the cut-and-cover principle, the mine powder in grains, the compressed and unenveloped powder and that compressed and confined in cartridges produced almost equally destructive effects.

It appears to be justifiable to use the tables prepared for dynamite magazines, buried or sunk and covered over, for estimating the clearance needed around powder depots of like kind with the proviso that one pound of black powder be considered equivalent to half a pound of dynamite.

2. In the case of an explosion of a light magazine in free air, the mine powder compressed to a density of 1.5 produces effects comparable to those of powder in grains. It is the most important conclusion of the Droitaumont tests that the effects are considerably reduced when the compressed powder is carefully put up in paper cartridges.

This reduction results from the slow progress of the inflammation. Consequently the pressure produced was more marked when the magazine had light walls and presented less resistance to the discharge of the first gaseous products. The weakening of the effect was considerably greater for the light magazines than for those which were sunken.

3. We can therefore increase the safety of magazines of powder when compressed and made into cartridges by dividing the powder into such suitable sockets that the inflammation of one of them will not be communicated to neighboring sockets. The experiments at Droitaumont ought to promote the use of socket magazines having unit cells capable of containing 1, 5 or 50 kg. (about 2½, 11 or 110 lb.). In the building of such a magazine, it seems necessary to reduce to a minimum all combustible parts.

Nearly half of the concluding part of the book is taken up by a bibliography and a list of the personnel of the department of mines in France. We recommend this list to those people who believe that our own bureau is disposed to undertake too large a scope. There are commissions on steam engines, automobiles and cartography, all under the control of the Mines Council.

MINE-RESCUE WORK IN CANADA. By W. J. Dick, mining engineer, Commission of Conservation, Canada. 48 pp., with index. Paper, 6¾x9⅝; 19 illustrations, mostly insets. The Rolla L. Crain Co., Ltd., Ottawa.

This book contains an account of the mine-rescue provisions of all nations and a full description of the excellent work being done in Canada. British Columbia requires rescue apparatus to be kept at all mines and it may surprise many to learn that when the book went to press in November, 1912, there were 182 mine-rescue apparatus in use or ordered, 22 belonging to the province of British Columbia.

An interesting chart shows the death rate in all the coal-producing countries. In 1902, Canada had a fatality of over 13 per thousand. Our own death rate in 1907, which approximated 5 per thousand, shrinks in comparison. Never before or since that time have our coal-mining operations been nearly so fatal as in that year.

Canada has difficulties which demand peculiar precautions. In some years past, its death rate has been lower than our own and this little volume shows that it has determined that the future risks of mining shall be reduced and is taking radical steps to that end.

COAL. ITS COMPOSITION, ANALYSIS, UTILIZATION AND VALUATION. By E. E. Somermeier, professor of metallurgy, Ohio State University. 169 pp., with index; 6⅛x9⅜; 8 ill. McGraw-Hill Book Co., 239 W. 39th Street, New York, Cloth boards. Price $2.

This book is written by undoubted authority and can therefore be recommended to anyone seeking information on coal as a heating agent. The word "composition" in the subtitle refers to its chemical characteristics, and has no reference to the physical and biological nature of the coal.

There are chapters on composition and heating value, chemical analysis, sampling, methods of analysis, determination of heating value, methods of reporting analysis, improvement of coal by washing, purchase of coal under specifications and on flue-gas analysis. Several analytical tables are contained in the concluding chapter.

It will be seen therefore that the book is valuable to the coal chemist and the coal user. The remarks on washing are purely applicable to the theoretical determinations of the chemist and do not take up washery practice and the efficiency of different methods.

Trifling exceptions may well be taken to the view that sulphur is an extraneous and not an intrinsic part of the coal, and to the use of analyses of ash which do not show the presence of titanic acid. This dioxide which runs from 0.10 to 1.30 per cent. in clays is usually found in coal, probably as an extraneous impurity. It is generally, as in these analyses, included as silica.

However, the exceptions we have taken detract in no manner from the value of a book which is intended for practical use and completely fits the place for which it was published. The coal analyst and coal burner will find in it those facts which are needed in their daily work and a book logically arranged and free from non-essentials.

# COAL AND COKE NEWS

### PENNSYLVANIA

#### Anthracite

**Edwardsville**—The Woodward Colliery of the Delaware, Lackawanna & Western R.R. Co., Coal Department, at Edwardsville, has been closed for repairs. The time of the suspension has not been announced, but it is expected to last about three weeks.

**Scranton**—The first strike to receive the indorsement of the district officers of the United Mine Workers since the signing of the agreement last spring is that at the Oxford Colliery of the People's Coal Co., at Scranton. The miners allege that the company is not abiding by the award of the strike commission of 1902 and the agreement of last spring, under which the mines of the anthracite field are being worked. The indorsement of the district union carries with it the support of all the anthracite miners, and implies that the union is to make an issue of the Oxford matter.

Mrs. Cora Evans, of West Scranton, widow of Joseph A. Evans, the rescue foreman of the U. S. Bureau of Mines, who lost his life in the Pancoast mine in Throop, Apr. 7, 1911, while leading a rescue party, has been granted a pension of $1320 by Congress. The pension is payable at once, and is equal to one year's salary.

#### Bituminous

**Meyersdale**—A coal mine is to be added to the varied industries of the Somerset County Home and House of Employment, according to the annual report of Poor Directors Jacob W. Peck, Chauncey F. Dickey and George F. Kimmel. The mine will be located on the county farm.

**Pittsburgh**—The meeting of the American Institute of Electrical Engineers will be held in Pittsburgh, Friday and Saturday, Apr. 18 and 19, under the auspices of the new committee, which has just been formed to discuss the use of electricity in mines. Of this committee Geo. R. Wood, consulting engineer of the Berwind-White Coal Mining Co., is chairman.

A number of interesting papers covering the various phases of this subject have been promised and it is expected that an interesting discussion will take place.

Owing to the location of the meeting in the heart of the bituminous coal mining district, it is expected that a large number of coal-mine papers will be presented.

### OHIO

**Columbus**—Operators in Ohio are fearful that the Gilson bill now pending in the Ohio General Assembly, which gives the right of eminent domain to condemn an approach to a mine will pass. It is claimed the bill is so loosely drawn that owners of coal mines could seize another mine and use it as an entry to their own mines.

The Green anti-screen bill, providing that miners shall be paid on the basis of all coal mined instead for that which does not go through a screen, passed the senate of the Ohio legislature recently by a vote of 21 to 8. Senator Green, father of the measure, pushed the bill through suddenly although considerable opposition developed. Senator Green stated that between 25 and 38 per cent. of the coal mined in the state goes through the screen. The measure as it passed the senate does not become effective until Apr. 1, 1914, when the present miners' scale expires.

**Bellaire**—Fire of unknown origin, starting in the oil room of the general store of the Pittsburgh Belmont Coal Co., at Neffs, just east of here, destroyed that structure, the warehouse adjoining and the blacksmith shop of Alex Neff, and threatened the destruction of the entire town recently. The loss was $25,000 with $14,000 insurance.

### KENTUCKY

**Winchester**—John C. M. Day, of this city, has discovered a seam of coal on his land, near Campton Junction, on the Lexington and Eastern R.R., east of here. He intends to begin working the mine at once.

**Whitesburg**—A 6-ft. seam of cannel coal is reported to have been discovered on the property of the Mineral Development Co., up Boone's Fork on the new Lexington & Eastern R.R. If the report is correct, the seam is one of the largest in eastern Kentucky.

**Jenkins**—John Potter, a farmer, will probably receive a fancy price for an acre of land now located in the heart of the town, which he reserved for his house when he sold his 200-acre farm to the Northern Coal & Coke Co., a few years ago. The Consolidation Coal Co., who bought the land and constructed the town, is said to have offered Potter $40,000 for his remaining acre, but he has thus far refused to sell.

**Lexington**—In connection with that part of the program of the Kentucky Mining Institute involving demonstration of first-aid work, to be given at its meeting on May 16 and 17, the treatment of various injuries will be required. For this purpose volunteers will be needed to submit themselves to the application of tourniquets and other first-aid devices, the use of the plumotor, and the like. Among the injuries which will be theoretically treated are listed right ear torn off, bright-red blood coming out in spurts (indicating a severed artery), compound fracture of right thigh, man unconscious, overcome by gas, broken back, electrocution, right hand cut off, and compound fracture of jaw. Naturally, it would be impracticable to produce these injuries for the occasion, and some skillful "faking" will be necessary in order to make the work as realistic as possible.

The Board of Examiners in the office of State Mine Inspector C. J. Norwood, at Lexington, Ky., has completed its examination of applicants for mine foremen's certificates, and has granted first-grade certificates to 7 men, second-grade to 17 men and third-grade to 2 men.

Under the gradings established by the Department, a first-class certificate entitles the holder to take charge of any mine in the state; a second-class qualifies him to assume the position of foreman in any nongaseous mine, and a third-class to take charge of any nongaseous mine not employing more than 26 men.

### TENNESSEE

**Coal Creek**—A 30-ft. vein of coal has been discovered near Coal Creek, according to recent reports, on a farm which has been taken over by parties who intend developing it at once. The property is said to lie between the Southern Ry. and the L. & N., and to contain three veins of iron ore, in addition to the coal.

### INDIANA

**Princeton**—William H. Raney, member of the district executive board of United Mine Workers, received a message from National President White, announcing that the National Board had given its consent for a 30-day test of a new explosive in the coal mine at Fort Branch, this county.

**Indianapolis**—The shotfirers' bill, which proposed to compel the operators to pay the shotfirers, failed to get through the Indiana legislature. The operators put up a stiff fight against it. The bill got through the House, but was killed in the Senate committee, of which Jacob C. Kolsem, operator, of Terre Haute, was chairman.

The new weights-and-measures law prohibits the selling of coal by the basket, unless the baskets are of standard bushel size. In the Ohio River towns, it has been the custom to sell coal by the "bushel" of 72 lb. and the "load," of 1800 lb. This will be superseded, probably by the 80-lb. basket and the full 2000-lb. load.

### CALIFORNIA

**Magalia, Butte Co.**—The boiler building and hoist at the Crystal mine, formerly known as the Princess mine, was destroyed by fire. R. C. Andress is superintendent of the mine.

## Coming Meetings

### ENGINEERS' SOCIETIES

The regular monthly meeting of the Engineers Society of Northeastern Pennsylvania will be held in the Board of Trade Auditorium, Scranton, Penn., Thursday evening, March 20, 1913, at 8:15 o'clock. Refreshments will be provided by the social committee. Subject: Centrifugal Fans, Design and Application, by E. B. Williams, manager mining department of the B. F. Sturtevant Company.

**HILL PUBLISHING COMPANY**

**Notice to Stockholders**

A special meeting of the stockholders of the Hill Publishing Company will be held on the 7th day of April, 1913, at 11:00 o'clock a.m., at the offices of the Company, 505 Pearl Street, New York, N. Y., for the purpose of voting upon the following propositions:

a. To increase the number of the directors to nine;

b. To increase its capital stock from $1,000,000 to $3,000,000, to consist of 30,000 shares of the par value of $100 each;

c. To classify the aforementioned increase of capital stock amounting to $2,000,000, so that $1,000,000 thereof shall be six per cent. cumulative preferred stock, also preferred on dissolution, and $1,000,000 thereof shall be common stock;

d. To alter the certificate of incorporation by eliminating the provision in Section 7 thereof relating to cumulative voting; and

e. To ratify the by-laws of the Company as amended by the directors.

Dated, New York, March 20, 1913.

JOHN A. HILL, President.
ROBERT McKEAN, Secretary.

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# Correction

In our issue of Mar. 8, Vol. 3, No. 10, in the third line of the last paragraph on p. 369, the word first-motion" should read "second-motion."

## PERSONALS

M. D. Reyer, of Birmingham, Ala., has resigned his position as assistant general manager of the Galloway Coal Co., and the position has been abolished. The duties are now being looked after by Cyrus Garnsey, Jr., general manager, of Memphis, Tenn., we will make his headquarters at Carbon Hill, Ala., where the largest operations of the company are located.

William Hadley, who was appointed temporarily superintendent of the Foundry Furnaces of the Tennessee Coal Iron & R.R. Co. on Nov. 1 last, when E. P. Williams resigned, was on March 1 transferred to his former position as assistant superintendant of the company's furnaces at Ensley. W. E. Oldham, superintendent of Vanderbilt Furnace of the Woodward Iron Co. has been appointed to fill the vacancy as general superintendent of Foundry Furnaces, comprising four furnaces at Bessemer, Alice Furnace at Birmingham, and Oxmoor Furnace at Oxmoor. Mr. Oldham was for a few years superintendent of Alice Furnace for the Tennessee Coal Iron & Railroad Company.

John Markle, head of the firm of G. B. Markle & Co., the Jeddo coal operators, has given out an official statement contradicting the report that he was to resign from the firm. He sails on March 22 for Europe, where he will undergo treatment by noted oculists.

Announcement has been received that F. F. Taplin, formerly sales manager of the Youghiogheny & Ohio Coal Co., will be president of the recently incorporated Cleveland & Western Coal Co. This concern will do a rail and lake business in coal from Pittsburgh and Ohio districts.

## CONSTRUCTION NEWS

**Lansford, Penn.**—Contractor Louis Riebe, of Lansford, is erecting a big washery at Haunte for the Lehigh Coal & Navigation Co.

**Middlesboro, Ky.**—The Mary Moose Mining Co., operating in the Middlesboro field, is planning to sink an additional shaft on its properties.

**Osaka, China**—The Osaka Shosen Kaisha has placed orders with the Osaka Iron Works for the construction of two 3000-ton steamers having a speed of 10 knots.

**Syracuse, N. Y.**—The Semet-Solvay Co. will build 20 additional coke ovens at Holt, Ala., increasing the plant 50 per cent., and daily capacity to 350 tons coal.

**Hamilton, Ohio**—Extensive improvements are being made at the plant of the Hamilton, Otto Coke Co., at Hamilton. These improvements will include a coal mixer.

**Coshocton, Ohio**—J. H. Daley, who has been operating a coal mine on the Lee Moore farm, at Mohawk, has opened up another mine on the L. N. McVey farm, near Walhonding.

**Saginaw, Mich.**—The Consolidated Coal Co., which controls the soft-coal mines in the Saginaw Valley, announced today that three new mines will be opened within the next month.

**Monongahela, Penn.**—A number of coal test holes are to be drilled in the vicinity of Eighty-Four this coming spring, with a view to the location of a number of coal shafts in that vicinity.

**Lonaconing, Md.**—Robert Izzett has a force of workmen engaged in reopening the mine on Big Vein Hill, near the Silk Hill. Mr. Izzett will devote himself to developing the fire coal business.

**Topeka, Kan.**—The Union Pacific coal chute that was destroyed a few days ago by fire, will be replaced by a new concrete and steel structure. The new chute will cost about $20,000, and its capacity will be about 200 tons.

**Cumberland, Md.**—The Stanton mine, at Short Gap, a mile east of Clarysville, will be ready to ship coal this week. This mine has been reopened by the Stanton Coal Co., of which Louis Stanton, of this place, is the president.

**Tamaqua, Penn.**—Besides ten dwelling houses the Lehigh Coal & Navigation Co. is erecting at Lansford and ten at Seek, near Tamaqua, it has contracted for twenty-five blocks of houses at Hauto for employees of the new electrical plant.

**Pottsville, Penn.**—The Kaska William Colliery, of the Alliance Coal Co., has been closed down for a full month. This was done to permit repairs, a fire having done great damage. A new shaft has been sunk 100 ft. and it is only about half finished.

**Connellsville, Penn.**—The interests which acquired the coal under the lands of the Peter Miller Estate, near Rogers Hill, in the Indian Creek Valley, will construct a coke plant of 50 ovens. The interests are represented by Charles Pore and H. N. Odbert, of Monessen.

**Jenkins, Ky.**—The Consolidation Coal Co. has started the construction of a large central hospital to be used by all of the company's constituent branches. The building is to be of brick and stone, and will cost in the neighborhood of $40,000. It will be completed within six months.

**Greensburg, Penn.**—Rockwell Marietta has purchased 134 acres of coal north of Wilpen and near to the plant of the Marietta Stillwagon Coal & Coke Co., of which he is president and manager. Engineers are now on the ground laying out the ovens, coal tipple and railroad sidings.

**Pottsville, Penn.**—The Locust Mountain Coal Co. has awarded the contract for breaker of 2500 tons capacity per day. Nine hundred thousand feet of lumber will be used in its construction. Baird Snyder, Jr., formerly superintendent of the Lehigh Coal & Navigation Co., is the head of the new company.

**Wellesburg, W. Va.**—The Finley Coal Co. will build thirty houses this spring to accommodate the employees of the company, fifteen of these will be built at their mines just north of the city and the remainder at the La Belle mine. The company also proposes to build a large electric plant at Buffalo Creek, near the old tipple.

**Pomeroy, Ohio**—Report is now extant among railroad men that the 12 miles' extension of the river division at Pomeroy, will commence when the good weather appears. Contractor John Lindsey secured the job. This extension will tap a virgin coal field in Meigs County, and should produce thousands of tons of tonnage annually for that division of the H. V. R.R.

**Birmingham, Ala.**—The contemplated construction of a railroad line in Walker County, joining the Jasper-Manchester R.R., to that now extending from Burgin, will mean development that will bring about expenditures of $2,000,000, at least. The Maryland Coal Co. is developing as fast as money and labor can do the work. Milton Fles is in charge of the coal developments in this section.

**Homer City, Penn.**—The Miller Construction Co. is beginning the building of a branch line for the Buffalo, Rochester & Pittsburgh R.R. in Indiana County, Penn., to tap the new mine opening of the Clyde Coal Co. A high trestle will be built in connection. A new mine opening at Craigsville, south of Punxsutawney, will also be given a railroad connection by the same construction company. The Clyde Company will put up about 45 houses for workmen.

**Wilkes-Barre, Penn.**—Sinking operations at the new shaft of the Butler Colliery, of the Hillside Coal & Iron Co., have been suspended temporarily, at a depth of seventy feet, in order to permit the concreting of the shaft for a depth of thirty-five feet. McConville and Fitzpatrick, of Pittston, are doing the concrete work. The inside dimensions of the shaft, after the concrete has been placed in position, will be twelve by twelve feet. After the completion of the concreting, the shaft will be sunk to a depth of about 150 feet.

**Birmingham, Ala.**—The Woodward Iron Co. is making improvements at its No. 2 Woodward mine, consisting of concrete and steel tipple and crusher building, electric hoist housed in a fireproof building built of brick with the tile roof. The ore will be handled in a 14-ton steel skip on the upper 1400 ft. of the slope, to which point it will be gathered in the mine cars by an auxiliary electric hoist in the mine and dumped in to a 300-ton bin from which it will be loaded into the skip. The power for operating the skips comes from the electric plant at their byproduct coke plant at Woodward, about three miles distant.

## NEW INCORPORATIONS

**Blocker, Okla.**—The Belt Coal Co.; capital stock, $25,000. Incorporators: James L. Brazel, Al Belt, and R. P. Harris.

**Hazard, Ky.**—The Kentucky Jewel Coal Co.; capital stock, $50,000. Incorporators: H. E. Bullock, D. C. Foley and T. F. McConnell.

**New York City, N. Y.**—Loyalsock Coal Mining Co.; capital stock, $100,000. Incorporators; F. C. Overton, J. R. Overton, E. P. Young.

**Louisville, Ky.**—The Drake Blue Gem Coal Co.; capital stock, $8000. Incorporators: T. B. Mahan, John Goias and Frank Owens.

**Armerford, Penn.**—The Armerford Coal Mining Co.; capital stock, $100,000. Incorporators: Charles C. Pfordt, C. F. Armstrong and A. L. Walker.

**Birmingham, Ala.**—The Donalison-Grant Coal Co.; to mine and sell coal; capital stock, $5000. Incorporators: G. J. Grant, G. M. and T. M. Donalison.

**Salt Lake City, Utah**—The Utah Coal Sales Co.; capital stock, $50,000. Incorporators: W. D. McLean, W. O. Bridgeman and George E. Forrester.

**Blocker, Okla.**—A charter has been granted to the Belt Coal Co.; capital stock, $20,000. Incorporators: James L. Brazell, of Hartshorne, president.

**Nashville, Tenn.**—The United Mining Co.; capital stock, $10,000. Incorporators: R. M. McMillen, S. M. Copper, Edward Maynard and Henry W. Curtis, Jr.

**Nashville, Tenn.**—The Southern Ice & Coal Co.; capital stock, $20,000. Incorporators: James H. McCall, O. T. McCall, A. McCall and James H. McCall, Jr.

**Camden, Ark.**—Dr. George Kimball, and associates, plan the organization of a $1,000,000 corporation to develop coal and clay property in Ouachita County.

**Ashland, Ky.**—The Southeast Coal Co. has been organized with a capital stock of $1000. The incorporators are John F. Hager, K. M. Fitzgerald and L. S. Wilson.

**Charleston, W. Va.**—The Camplatt Coal Co.; to develop coal; capital stock, $200,000. Incorporators: W. I. Robinson, H. C. L. Forler, R. M. Mackenzie, A. A. Meyers and A. Meyers.

**Packard, Ky.**—The Drake Blue Gem Coal Co. has been organized at Packard, Ky., with a capital stock of $8000. The incorporators are T. B. Mahan, John Goins and Frank Owens.

**Phœnix, Ariz.**—The Frontenac Mining Co.; to deal in coal and other mineral lands and mine coal and other minerals; capital stock, $100,000. Incorporators: Wm. C. Muntz, and others.

**Prestonsburg, Ky.**—The Beaver Pond Coal Co., has increased its capital stock from $20,000 to $50,000, with a view to extending its operations and enlarging its existing plants.

**Houston, Tex.**—The G. B. Zigler Co.; to drill, open and work mines for obtaining oil, coal ore, etc.; capital stock, $25,000. Incorporators: G. B. Zigler, W. A. Rowson and N. S. Wishenhunt.

**Wheeling, W. Va.**—The Richland Block Coal Co.; to develop coal fields; capital stock, $100,000. Incorporators: J. C. Long, H. B. Lockwood, L. W. Brown, Nelson C. Hubbard and L. L. Talbot.

**Cleveland, Ohio**—The Euclid Brick & Supply Co.; builders' supplies, coal, etc.; capital stock, $100,000. Incorporators: L. J. McFarland, Don B. Swisher, O. B. Long, C. M. Addison and D. Strader.

**Phœnix, Ariz.**—The Slug Gulch Mining Co.; to deal in coal and other mineral lands and to mine coal and other minerals; capital stock, $400,000. Incorporators: Fred H. Larsen, H. A. Babbitt and others.

**Boston, Mass.**—The Wakefield Coal Supply Co.; capital stock, $35,000. Incorporators: Edward P. White, F. Horace, Perley, Herbert M. Whitten, Albert R. Perkins, Daniel D. Peabody and George H. Smith.

**Birmingham, Ala.**—The Black Warrior Mill Co.; to develop coal and mineral lands and to do a general sawmill business; capital stock, $100,000. Incorporators: E. L. More, Cyrus A. O'Nealand, Henry Stanley.

**Cleveland, Ohio**—The Cleveland & Western Coal Co. has been organized by F. E. Taplin, F. C. Danielson and E. W. Astel. The new company will do a lake and rail business, principally from the Pittsburgh district.

**Shawtown, Ohio**—The Shawtown Grain Co.; general elevator business, coal, cement, fencing, etc.; capital stock, $10,000. Incorporators: F. S. Burhley, W. S. Moorhead, F. S. Robinson, B. J. Otte and George B. Mulford.

**Wilmington, Del.**—The Artificial Coal Co., of Philadelphia; capital stock, $100,000; to acquire lease, own and control coal mines of all kinds. Incorporators: J. Howard Much, John D. Wolf, John T. Waite, all of Philadelphia.

**Cleveland, Ohio**—The Cleveland & Western Coal Co.; to do a lake and rail business. Incorporators: F. E. Taplin, F. G. Danielson, E. W. Astel and J. M. Todd. All the members of the new firm were formerly connected with the Y. & O. Coal Co.

**Pine Bluff, Ark.**—The Ark-Ol Manufacturing Co. has been organized here to manufacture products from lignite coal. The officers are John Holmes, president and general manager, Clifton Howell, vice-president, and Frank Tomilson, secretary.

**Hopkinsville, Ky.**—The West Kentucky Fuel Company has been incorporated with a capital stock of $5000, to engage exclusively in the wholesale coal business at that point. The incorporators are Paul Wynn, Sam W. Wynn and James Breathitt, Sr.

**Shamokin, Penn.**—A charter has been granted to the Northumberland Coal & Coke Co., of Shamokin Dam, Penn., with capital stock of $10,000. The company intends to mine and market coal and will establish a coaling station at Shamokin Dam.

**Jefferson City, Mo.**—A charter has been granted to the George E. Smith Coal Mining Co., Hudson Township, Macon County; capital stock, $5200. Incorporators, George E. and Annie Smith, Andrew H. Clark, Roy D. Conley and John Parker McCanne.

**Birmingham, Ala.**—The Donaldson-Grant Coal Co., Inc., has been incorporated with C. J. Grant as president and general manager and J. M. Donaldson as secretary-treasurer; capital stock, $5000. The company will do a general coal mining and selling business.

**Concho, W. V.**—The Rock Lick Coal Co.; to mine coal in Fayetteville district of Fayette County, W. Va., drill for oil and gas; capital stock, $200,000. Incorporators: Angus W. McDonald, V. L. Black, O. P. Fitzgerald, John Wherle and L. G. Summerfield, all of Charleston.

**Punxsutawney, Penn.**—The Brush Creek Coal Mining Co.; to mine, quarry, excavate and bore for and otherwise produce coal, iron ore, limestone, fireclay and other minerals and substances. Incorporators: Lucius W. Robinson, Lewis Iselin, B. M. Clark, F. H. Beck and J. W. Brown.

**Columbus, Ohio**—Papers of incorporation have been filed with the secretary of state of Ohio for the Kittaning Coal Co. of Columbus with a capital stock of $10,000, to mine and deal in coal. The incorporators are, C. E. Leslie, A. H. Jones, J. C. Yontz, Herbert M. Myers and M. H. Recob.

**Cincinnati, Ohio**—The Beaver Pond Coal Co. has started new financing in the shape of an increase of the capital stock from $20,000 to $50,000. The new issue is to be in the shape of preferred stock at 8 per cent., par value $100. Headquarters of the company are at Prestonburg, Ky., at the mines.

**Charleston, W. Va.**—For the purpose of mining coal, drilling for oil and gas, operating coal washeries, mills and manufacturing plants, in Brooke County, W. Va., a charter has been issued Richland Block Coal Co., Wheeling; capital stock, $100,000. Incorporators: J. C. McInley, H. B. Lockwood, L. W. Brown, Nelson C. Hubbard, and L. L. Talbot, all of Wheeling.

## INDUSTRIAL NEWS

**Indianapolis, Ind.**—The South Side Lumber & Coal Co., Kokomo, has increased its capital to $20,000.

**Columbus, Ohio**—The D. A. Thomas Coal Co. will develop about 1000 acres of coal land near Seng, W. Va.

**Sullivan, Ind.**—Twenty-five land owners in Curry Township have filed deeds for part of thir land to the Indiana Coal Co., and it is expected mining operations will begin promptly.

**Shamokin, Penn.**—While engaged in driving a tunnel at the Bear Valley shaft, owned by the Philadelphia & Reading Coal & Iron Co., workmen uncovered a 7-ft. seam of fine anthracite coal.

**Ryder, N. D.**—While drilling for artesian water on the Ben Rosenberg claim near here, the drillers struck a seam of coal at a depth of 170 ft. Samples of the coal will be sent to experts at the university for testing.

**Connellsville, Penn.**—The Berwind-White Coal Mining Co. is developing a mine between Harborton and Pan, Va. The shaft will be 600 ft. deep. The company will build a town which will have 750 dwellings, and will open a 12,000-acre tract.

**Philadelphia, Penn.**—Philadelphia capitalists are making overtures for the purchase of the 10,000-acre tract of coal land recently taken over by Howard Davis, of Conemaugh, George Gore, of Johnstown and others, at Garway, near Hastings.

**Artemus, Ky.**—The Anchor Coal Co. has been purchased by J. B. Rogers and associates, and the company will be reorganized, with Mr. Rogers as general manager. The facilities of the plant, and its capacity, are to be increased by the installation of additional machinery.

**Belle Vernon, Penn.**—Men from Monessen will open a 540-acre tract of coal in the Indian Creek Valley next week. John I. Rogers' plant has been taken over by Pittsburgh men and the output will be increased to 200 tons a day. The Pittsburghers will take charge at once.

**Altoona, Penn.**—The Pennsylvania Coal & Coke Co., operating mines throughout Cambria County, will this summer electrify all its working. The Penn Central Electric Co. of this city will furnish the power. The company will also build new offices at several of its mines.

**St. Louis, Mo.**—The Mississippi River Commission, Major Clarke S. Smith, secretary, Liggett Building, is asking for sealed proposals for furnishing 380,000 bushels of coal in barges, to be opened at noon, on Apr. 5. Major Smith will furnish all necessary information on the subject.

**Welch, W. Va.**—The Pocahontas-West Virginia Coal Co., a new operation at Leckie, nineteen miles above Welch on the Tug Fork branch is pushing its work rapidly. Mine No. 1 is equipped with electric power and No. 2 with a gasoline engine to haul the coal. William Leckie is president.

**Connellsville, Penn.**—The Jamison Coal & Coke Co. is electrifying all of its mining and coking plants in the Greensburg-Connellsville field, substituting electricity for compressed air. Fifteen locomotives, electrical machines, dynamos and generators have been purchased, and nearly all of the new equipment has been installed.

**Columbus, Ohio**—Pennsylvania Railroad officials here have announced that the Sandusky docks of this company will be extensively improved before the opening of the navigation season. It is expected that the capacity practically will be doubled and new loading machinery added, which will greatly facilitate the coaling of vessels.

**Pittsburgh, Penn.**—The Buffalo & Susquehanna Coal Co. will hereafter pay the miners regularly on the 15th and 30th of the month, instead of at somewhat irregular times twice a month. In some of the mines the men are to be allowed to load something more than the former exact two tons to the car. This will result in an increase of earnings.

**Irwin, Penn.**—The Penn-Westmoreland Coal Co. a new organization, has taken over the J. A. Guy block of four-foot coal, just east of West Newton and expects to put the product on the market this summer. The tract comprises about 100 acres, $60,000. The company has purchased from Charles Suter ground for tipple. A. R. Byers, of New Stanton, is president.

**Binghamton, N. Y.**—With nearly 500 acres of land situated just northeast of Port Crane, leased or sold to Scranton capitalists, the plan to mine coal in that village is fairly well under way. The H. A. Allerton farm of 150 acres and the Willian Bunzey farm of 100 acres are among those said to have been leased to the Scranton people. Boring will be started as early as possible.

**Brockwayville, Penn.**—C. A. McDonald and other DuBois men have leased the mine property at Westville formerly operated by the Jefferson Coal Co. and are re-opening the same for the purpose of shipping coal. They will also lease an additional ten to twenty acres. The new company will be known as the Sandy Lick & Rochester Mining Co., and will be managed by Mr. McDonald.

**Morgantown, W. Va.**—A deal for the sale of 500 acres of coal in the Union district has been consummated. Surface, Pittsburgh, Sewickley and all other seams of coal were sold to W. H. Seymour, of Pittsburgh, and the price was $300 an acre. The property is situated between the Stewartstown and Warm Hollow roads in the Union district. The purchasers expect to develop it without delay.

**Nicktown, Penn.**—Options on what is probably the biggest undeveloped tract of coal in Cambria County are being taken by Anselm Kirsch and his brother, A. F. Kirsch. Between 6000 and 7000 acres are involved. It will eventually fall into the hands of the Manor Real Estate & Trust Co. The deal, if put through will mean the exchange of something like $600,000. Between 50 and 60 owners will get a portion of this sum.

**Louisville, Ky.**—Certain well-defined rumors current in the Harlan field indicate that foreign capital other than Welsh is on the verge of becoming heavily interested in that region. Exact details of the deal are not yet available, but it is stated on good authority that French interests are involved in a purchase which has practically been arranged. A few days more will probably see its consummation, and full details will be published.

**Whitesburg, Ky.**—A big Letcher County deal, recently reported, is that closed by Maxwell & Litts, of Wise County, Va., for a tract of about 2000 acres, lying on the proposed line of the Cincinnati, Licking River & Virginia R.R. The development of the property will probably await the construction of the road, which promoters intend to begin this spring or summer.

**Waynesburg, Penn.**—P. J. Bradley and J. J. Koelfert closed a big sale of coal with Fayette County parties last Saturday. They disposed of 490 acres of coal in Wayne and Gilmore Townships, Green County, at a consideration of over $100,000. Local parties who owned the coal are P. J. Bradle, J. J. Koebert, J. L. Rush, Delbert Orndoff, R. E. Kent, of Waynesburg; Frank Gump, of Mt. Morris, and Dennis and Peter Meighen, of Jollytown.

**Pittsburgh, Penn.**—At the request of a number of customers, the Goodman Mfg. Co. has decided to open a repair and supply department in Pittsburgh. This will be known as the Pittsburgh Repair & Supply Department, 700 Phipps Power Building. E. Kent Davis will be manager.

The electrical repairing done in this shop will be of the same high-grade character as they do in their Chicago shops.

The Goodman company is now carrying in Pittsburgh a small stock of shortwall machine parts, and expect, within a short time, to have a complete stock of parts for this type of machine.

**St. Louis, Mo.**—Representatives of the Eastern Coke and Coal Syndicate who have been here two months are said to have options on tracts of land on both sides of the river. They are reported to have obtained nearly 200 acres on both sides of the River Des Peres, between Broadway and the Iron Mountain Railroad.

Part of the tract was owned by the Laclede Gas Light Company. Julius Pitzman, civil engineer and investor, who owns a large tract there, says that he has been dealing with a prospective buyer, but that he does not know whom the agent represents.

**Cincinnati, O.**—Details have been arranged for the transfer of coal property which involves over half a million dollars and which will be the second large holding of the Canadian coal interests in the West Virginia fields.

Captain Michael Roach, the president of the New River and Ohio Coal Co., has arranged the sale of the properties to the Lake Superior Coal Co., which is a subsidiary of the Superior Co., the largest coal, iron and paper pulp producer of Canada.

This company bought the Cannelton Coal & Coke Co., in the Kanawha district. Coal from these mines is shipped to the headquarters at Sault Ste. Marie.

**Pineville, Ky.**—It is reported that the Harlan Coal Mining Co. has recently leased to the Lick Branch Coal Co., composed of John W. Williams and associates, its recently completed coal-mining plant at Croxton, Ky., in the Harlan field. The new plant is one of the largest in capacity and most uptodate in equipment in the eastern Kentucky field, and under the management of the experienced operators who have leased it, is expected to cut a considerable figure in the production figures. It is probable that with this plant off its hands the Harlan Coal Mining Co. will shortly begin the construction of another plant in that vicinity. The lease referred to is said to provide for minimum royalties aggregating $100,000 during the first five years, with the privilege of renewal for an additional five years, during which period the royalties are fixed at a minimum of $125,000.

# COAL TRADE REVIEWS

## GENERAL REVIEW

Anthracite orders for April delivery, when the spring discounts will be in effect, are coming in rapidly, and indications are that the trade will be active over that month. In fact, some believe that production will be so heavy through April and May that June, and even July, may find prices still below the April circular.

At the moment, the hard-coal market is slow and dull. It has been definitely announced that the customary spring discount will go into effect the first of the month, so consumers are cutting orders to the lowest possible minimum, in order to avoid carrying over any of the high-priced product. As a result, current orders are scarce. Production is still being restricted, and some stocks are being accumulated. Egg is particularly easy and is being freely offered at well below the April circular; pea size continues the strongest of the hard-coal grades.

Conditions in the Eastern coast-wise bituminous trade are unsettled and inclined to be a little tense. Pocahontas and New River operators are actively seeking contract business, but the consumers do not believe they are justified in the large increase they are demanding over last year's quotations, and, as a result, little business is being closed, and the contract market is decidedly dull. Spot prices are ranging 10 to 15c. below contract asking prices. Pennsylvania operators are holding off on prices, pending a more settled condition in the labor situation in West Virginia, which now appears to be assuming serious proportions. In the event of extensive trouble there, the Pennsylvania operators will be materially benefited. What contracts are being closed are for uniformly heavier tonnages than during the previous year.

The Pennsylvania and the Western Maryland railroads have both announced that, effective Mar. 20, they would accept consignments for Lake destinations, and it is believed the initial shipments will be heavy. Deliveries on the Northern border are still a trifle uncertain, but railroads are rapidly gaining control of the situation; consumers in this district point to numerous low prices being quoted, but dealers claim the trade is steady and showing a strong tone. In the Pittsburgh district shipments to the Lake trade are rapidly increasing.

The demand in Ohio continues fair, and there is considerable activity in renewing contracts; operators believe that industrial conditions are steadily improving and that consumers will soon be in the market for a large tonnage. The domestic dealers have fair stocks and will be out of the market until the fall stocking begins; prices remain at a rather low level. Coal continues to accumulate at Hampton Roads, in spite of some curtailment on the part of the operators, who are, however, firm in the belief that there will be a distinct improvement in the trade shortly. The dumping is rather light, and few contracts are being let, but there is a good demand on the existing ones, and the export business continues to show a steady increase.

The Middlewestern retailers have definitely concluded buying for the current year. Prices are down to the summer schedule and are showing no disposition to change. There is a total absence of activity in the trade.

## BOSTON, MASS.

There is much uncertainty over bituminous prices. Most of the agencies for Pocahontas and New River are actively seeking contract business on the $2.85 f.o.b. Hampton Roads basis, but only a small share of the total tonnage of those coals for New England is understood to have been placed. The larger buyers particularly, are declining to accept so high a figure, feeling that conditions do not warrant so large an advance over 1912, both on coal and on water transportation. The result is that the contract market is decidedly dull. The fact that spot coal is still being offered more or less freely at from 10c.@15c. less than on contract, and that certain shippers are going slow on commitments after Apr. 1, in view of possible labor troubles in the New River field, makes the outlook rather complicated. The Georges Creek and Pennsylvania shippers are awaiting developments on the Southern coals before announcing their own season prices, so that in general the spring prospects on bituminous are more or less mixed.

Georges Creek is now coming to tide in better volume and the demand seems right up to the supply. Coals from the Pennsylvania districts are being railed only on orders and there is only a moderate call for the medium grades. Demurrage has been paid for coal standing at Philadelphia and at New York, but the accumulation was not significant and is now well cleared up. Prices at the mine are practically unchanged and the movement all-rail is steady for the more popular coals.

Water freights are strong at 95c.@$1, Hampton Roads to Boston, with 75@85c. on yearly contract on large vessels. The Reading barge rate on bituminous has been reduced, however, from 90 to 80c., Philadelphia to Boston. On Long Island Sound freights from New York are 40@50c., with a demand now for anthracite shipment the last of March at April prices.

Anthracite is expected to start in with a rush Apr. 1. Orders have been filed for all the Eastern points and shipments are expected to be heavy until the retailers get their storage filled and call a halt. There is quite a tonnage being carried over at almost all the New England points and the weather is so mild that this situation is not likely to improve.

With a fair amount of domestic sizes taken on in April and May the dealers are likely to rest on their cars until the demand from the public begins to deplete their stocks. Egg is in the least demand and continues to be offered by the independents at prices well below the anticipated April circular. There is a fear on the part of some anthracite buyers that there will be such a surplus of individual coal mined in July that prices then will be as low or lower than the companies' list for April. This feeling is not shared, however, by the dealers who have had experience before with dull years in anthracite. At least, those whom the companies served well in 1912 are apparently quite willing to let the same companies fill them up during April and May.

Present wholesale quotations are about on the following basis:

| | |
|---|---|
| Clearfields, f.o.b. mine | $1.25@ 1.45 |
| Clearfields, f.o.b. Philadelphia | 2.50@ 2.70 |
| Clearfields, f.o.b. New York | 2.80@ 3.00 |
| Cambrias, Somersets, f.o.b. mines | 1.30@ 1.65 |
| Cambrias, Somersets, f.o.b. Philadelphia | 2.55@ 2.90 |
| Cambrias, Somersets, f.o.b. New York | 2.85@ 3.20 |
| Pocahontas, New River, f.o.b. Hampton Roads | 2.65@ 2.80 |
| Pocahontas, New River, on cars Boston | 3.80@ 3.90 |
| Pocahontas, New River, on cars Providence | 3.75@ 3.90 |

## NEW YORK

**Bituminous**—There are rumors current in the local market that a number of the smaller operators have succeeded in closing contracts covering their production over the next contract year. This would seem to indicate an increased activity in contracting, but since only the smaller companies were mentioned in this connection, the tonnage involved is probably not large. As a matter of fact, operators are finding it difficult to close, particularly with the larger consumers, who are holding off, apparently in hopes of a sharp decline in the spot market, which would naturally have a sympathetic effect on contract business.

There has been little change in the prompt market, which still continues rather dull and weak, particularly on the lower grades. The better qualities are in good demand and slightly short in supply. Stocks of all kinds and size at tide have fallen off considerably during the week. Production is still being curtailed, especially those operations producing off quality. Prices have experienced no change, except on the West Virginia steam grade, which we quote 5c. off of the price prevailing over the last three weeks, the market being about as follows: West Virginia steam, $2.55@2.60 fair grades, Pennsylvanias, $2.65@2.70; good grades of Pennsylvanias, $2.75@2.80; best Miller, Pennsylvania, $3.05@3.15; Georges Creek, $3.25@3.30.

**Anthracite**—Several of the large companies have sent out instructions to their agents to the effect that the customary spring discount on the domestic grades will go into effect Apr. 1 as usual. With this feature finally eliminated from consideration, buying is becoming even more restricted, and there is an almost total absence of any demand for the domestic sizes; dealers and consumers generally have sufficient coal on hand to carry them over until the first of the month, and consequently there is no incentive to buy.

Production in the mining regions is still being curtailed, most companies laying off on an average of three days per week. However, this feature is being welcomed by the operating departments, who are taking advantage of the idle time to effect repairs which have been accumulating for several months, while the mines were working under a heavy pressure. With the lowest prices of the year in effect next month, it is expected there will be a great deal of activity in the trade. All sizes are in ample supply, with the exception of pea, which, as has been the case for several months, is a little difficult to obtain.

Quotations have not undergone any material change during the week. Both stove and barley have suffered a slight decline, while chestnut is quotable on a little higher basis. The following are the nominal New York prices on hard coal:

| | | Individual | |
|---|---|---|---|
| | Circular | Lehigh | Scranton |
| Broken | $5.00 | $4.50 @ $5.00 | $4.50 @ $5.00 |
| Egg | 5.25 | 4.55 @ 5.20 | 4.75 @ 5.25 |
| Stove | 5.25 | 4.70 @ 5.20 | 4.75 @ 5.25 |
| Chestnut | 5.50 | 4.95 @ 5.45 | 5.00 @ 5.50 |
| Pea | 3.50 | 3.45 @ 3.55 | 3.50 @ 3.60 |
| Buckwheat | 2.75 | 2.00 @ 2.45 | 2.50 @ 2.75 |
| Rice | 2.25 | 1.80 @ 1.95 | 2.25 |
| Barley | 1.75 | 1.10 @ 1.50 | 1.60 @ 1.75 |

### PHILADELPHIA, PENN.

About all the dealers are doing now is waiting for Apr. 1, when the reduction in the price of anthracite goes into effect. It is practically understood now, that there will be the same reduction as customary in normal years. Some of the companies have already issued circulars making this announcement. The individual operators have been using this April price as a basis for some time past, and even so are not having particularly easy sledding in getting rid of their product. Dealers are loth to turn down an offer for a car of egg, stove or chestnut at fifty cents off the present circular prices, but when it comes to putting on coal now that they really do not require, that is another matter. The thought of the premiums of $1.50 to $2 per ton they were compelled to pay to these same individuals no less than three months ago, still lingers in their minds, and there will undoubtedly be lots of feeling manifested in the placing of orders during the coming season. Companies that took care of their own trade and gained new friends, are likely to hold on to them.

It is useless to speculate on the coming business for the month of April as it could not help being good. Every dealer has a little space that he would like to see filled up at the reduced price, and this will make an active demand, which perhaps may be duplicated in May. The weather for the balance of March is not likely to be conducive to the clearing up of stocks purchased at the old prices, and in almost every case, some coal will be carried over. It is understood that the large companies are still receiving orders for the prepared sizes, but they are few and far between, and it is further understood that they are obtaining the full prices.

Instead of reduction in quotations Apr. 1, there is talk among bituminous operators of advancing the price on contracts after March 31, and as a consequence, there is a little flurry to get as much of the old-priced coal as possible. This is particularly true at Tidewater points, where considerable coal is moving. Whether the threat will hold good remains to be seen, but judging from present conditions, it will be a difficult position to maintain. The soft-coal trade at this time seems to be willing to take almost anything that is offered, in the way of prices.

### PITTSBURGH, PENN.

**Bituminous**—Mining and shipping of coal for the Lake trade has increased and is now of considerable proportions, although practically confined to Lake shippers who have mining interests of their own. The production of so much ¾-in. coal has naturally increased the supply of slack which has resulted in the premium for this coming off, the slack market being now quotable at the regular figure of 90c. The coal market as a whole is not overly firm, chiefly because a number of small operators are indifferently well supplied with contracts and are occasionally cutting prices. The large interests are adhering closely to schedule prices, which we continue to quote as the general market: Slack, 90c.; nut and slack, $1.05; nut, $1.25; mine-run, $1.30; ¾-in., $1.40; 1¼-in., $1.55, per ton at mine, Pittsburgh district.

**Connellsville Coke**—Demand for both spot and contract furnace coke has continued extremely light, but for foundry coke it is slightly improved. Production has decreased a total of 30,000 tons a week, according to the last report, and the position is sound, as actual consumption is fully up to the record. The decrease in production has been due chiefly to restriction by operators making off coke, which can hardly find a market now at any figure. In December and January cokes running above 1.25 per cent. in sulphur and very high in ash were accepted in lieu of anything better, but today furnaces will hardly consider a badly cut price if it involves coke running even a tenth per cent. above the recognized sulphur limit of 1 per cent., or running much above 12 per cent. ash. Such off cokes are available, at least as low as $2.20 for prompt furnace, and perhaps might be had at $2. Standard furnace coke we quote fairly firm at $2.40, with contract nominally at $2.50. Foundry coke is quotable at $3@3.50 for both prompt and contract, depending on grade, per ton at ovens.

### BALTIMORE, MD.

The orders so far booked by the Consolidation Coal Co., for delivery during the next six months, show an increase of over 500,000 tons as compared with the same period of the previous year; this is mostly for coal from the Fairmont field. This increase in tonnage has done much to revive hope in the Baltimore market.

By the last of the week, coal from the West Virginia and Pennsylvania fields will begin moving to the Lakes. The Western Maryland Ry., following in the footsteps of the Pennsylvania, has notified shippers that the road would accept Lake shipments on Mar. 20. All business received will be forwarded to Buffalo and other lake ports and held there until the Lake traffic opens. There is considerable business ready to be turned over to the roads, and it is believed that the initial shipments will be large.

Prices softened a bit on spot business during the week, where low-grade coals were concerned; sales were reported under $1. But only a slight change took place in the price of the better grades. The car situation seems to have been eliminated as a factor in the trade. About the usual activity was witnessed at the railroad piers. The coke market continues fairly firm and there has been a slight reduction in the output of the product, especially in the Connellsville region.

### BUFFALO, N. Y.

There is still much complaint that the railroads are making uncertain deliveries and thus complicating the bituminous trade badly. One operator says that he has been billing out coal for ten days, but none of it has yet reached destination. It looks as though the roads were getting farther behind in certain branches of their business in spite of the fact that the weather is more favorable to quick despatch.

Another disturbing element in the bituminous trade is the resumption of shipments to the Lake ports. There is such a shortage of coal in the Northwest that much lake tonnage will be loaded before the opening of navigation. A favorite size for this trade is three-quarter, which necessitates the turning out of a great amount of slack and sometimes breaks that market badly. Often the Lake firemen refuse to handle anything but three-quarter for steamer fuel and that also increases the amount of slack.

There is more unsold bituminous on track generally than for sometime, so that everything indicates a period of quiet trade. There will be small fluctuations that the active salesman will take advantage of, while the slow one will get left. The contract season is on and there is some indication that prices are to be held stiffer than they were last year. The lowest bid for furnishing nut and slack, to the Buffalo State Hospital, is $1.99, as compared with $1.93 last year; the bidder who obtained the contract last year now bids $2.05, which shows what he thinks of the business. It is understood that there is likely to be a good amount of docking for ash and other tests.

Buffalo anthracite shippers are loading considerable hard coal into lake steamers, but the D., L. & W. is handicapped by a dispute with the government over possession of the dock. It now appears that the fast-accumulating anthracite will have to be dumped in great part, as a loaded steamer is grounded at the Lehigh Valley dock, blocking it completely.

Bituminous prices are held pretty firmly in spite of the lack of demand, on the basis of $2.80 for Pittsburgh lump, $2.65 for three-quarter, $2.55 for mine-run and $2.15 for slack, with Allegheny Valley and Reynoldsville 15 to 25c. lower. It is said that coke is becoming firmer, but jobbers generally admit that it does not sell here for more than $5 for best Connellsville foundry.

### COLUMBUS, OHIO

While the weather has not been favorable for an active coal trade, there has not been any great falling off during the past week. There is a fair demand for tonnage from

steam users and considerable activity is shown in the renewing of fuel contracts by the railroads. The domestic trade is a thing of the past and operators and shippers are looking forward to a rather active Lake trade.

Dealers have pretty fair stocks generally. This means that they will not be in the market for much coal until the stocking up period begins later in the season. On the whole the retailers had a pretty fair trade despite the unfavorable weather conditions. They secured good prices generally and not a great deal of trouble was experienced in obtaining prompt deliveries from the mines.

Operators, especially those who engage in the Lake trade, are anticipating a good demand from the Northwest. Reports from that section show that the docks have been well cleaned up and this means an active season. Improved dock machinery is being installed at many places in order to take care of the expected increase in tonnage.

Prices are still at a rather low level and no improvement in that direction is expected for the time being at least. Dock prices have not yet been determined and there is a strong movement to place them back to the level of two years ago, before the recent decline. Chartering of boats is going on and everything is being arranged for the opening of navigation.

Quotations in the Ohio fields are as follows:

| | Hocking | Pittsburgh | Pomeroy | Kanawh |
|---|---|---|---|---|
| Domestic lump | $1.40 | .... | $1.50 | $1.40 |
| ¾-inch | 1.30 | $1.20 | 1.35 | 1.30 |
| Nut | 1.25 | ..... | 1.30 | .... |
| Mine-run | 1.10 | 1.10 | 1.15 | 1.10 |
| Nut, pea and slack | 0.80 | ..... | 0.75 | 0.80 |
| Coarse slack | 0.70 | 0.85 | 0.65 | 0.70 |

### HAMPTON ROADS, VA.

There has been little actual change in the coal situation at Hampton Roads; prices remain at about the same level, few contracts have been let and the dumping has been comparatively light. The accumulation of coal still continues notwithstanding light loading and some curtailment of output, the effect of which will appear later. An encouraging feature is the steady demand on existing contracts, which, with the growing export tonnage, represents about all of the coal loaded at the piers during the past week.

There is more talk of labor troubles in the smokeless coal fields and there is undoubtedly a deep feeling of unrest among the miners. To combat this one of the larger New River operators has voluntarily given some concessions to the men, in the shape of a two-weeks' payday and a nine-hour day. It is also said that the Berwind interests in the same field have announced substantial concessions.

What changes the coming two weeks will show in prices, it is difficult to predict, but those best informed anticipate a change for the better and a stronger demand. There is no doubt of the steady contract growth of the export business, emphasized by the shipments to markets not entered by our coals until lately and by the increasing prestige of these abroad, as shown by the items in the foreign trade papers regarding the American product.

### LOUISVILLE, KY.

It is rather odd that there is almost as much domestic coal moving from the mines as during any time in the fall and in December, when the demand was brisk, in anticipation of some real winter weather, and the car shortage kept the mines down to about half-time. The poor demand now has cut operations down to about the same extent. Sales are only to supply current requirements, as dealers are doing little stocking, being generally pretty well supplied.

Prices remain at about the same levels as heretofore reported. The best grades of Jellico block are quoted at $2 a ton f.o.b. mines, with 3-in. lump and block at $1.85, and larger sizes at $1.90, but it is doubtful what sales are being made. Round is priced at $1.60, with domestic nut at about $1.50. The best grades of nut and slack from both the eastern and western Kentucky districts can be had for 75c., the lower grades being available in fair quantities at 50 to 60 cents.

### BIRMINGHAM, ALA.

The increased requirements of the blast furnaces in this district are serving as an excellent stimulant to both the steam coal and furnace coke markets. Keen competition from other districts seems to have weakened the foundry-coke market, but the quality of Alabama cokes, due largely to superior methods of preparation, is enabling local producers to obtain higher competitive prices than ever before.

Contracts are being closed rapidly for the year on domestic coal, all protests against the recent increase in price having apparently disappeared. One of the largest producers of Cahaba coal reports their April output fully sold up. Industrial conditions in the South are, as a whole, on a prosperous basis and the outlook for the year is bright.

The state mine inspector's office has given out Alabama coal-production figures for the year 1912, the exact output being 16,513,040 short tons. These figures are somewhat below early estimates, the production for the latter half of the year having been cut down considerably on account of shortage of cars. Equipment is plentiful at this time and the rate of production is much higher than the average of 1912.

### INDIANAPOLIS, IND.

There is little change in the Indiana coal situation; prices, having got down to about the summer schedule, are showing little or no change. It is reported that there are mines ready to make alluring concessions but operators in general say it would be useless, especially on domestic grades.

Retailers have practically finished buying for the present coal year and will be glad to be able to dispose of all they contracted for. Considerable more coal has been available since the new year opened than usual in this city. The declining prices at the mines, when January showed that the winter was going to be mild, enticed new ventures in the trade, for it was seen that the old established operators would have to hold up prices on account of having made high contracts in the fall, when the supply situation looked ominous. The smaller ones have been making considerable fuss about their cut prices.

The standard retail prices in this city are:

| | | | |
|---|---|---|---|
| Anthracite, nut | $9.25 | Winifred | 4.75 |
| Anthracite, grate, egg and stove | 9.00 | Falling Rock, cannel | 6.50 |
| Lump | 6.50 | Linton lump | 3.75 |
| Pocahontas, forked | | Linton, egg | 3.75 |
| Pocahontas, shoveled lump | 6.00 | Hocking Valley | 4.75 |
| Pocahontas, mine run | 5.00 | Hocking Valley, egg | 5.00 |
| Pocahontas, nut and slack | 4.00 | Brazil block | 4.50 |
| Blossburg | 5.50 | Gas house lump coke | 7.00@8.00 |
| Ohio Jackson | 5.75 | Crushed gas coke | 7.00@8.00 |
| Raymond | 4.75 | Citizens oven coke | 7.00@8.00 |
| Kanawha lump | 75 | Connellsville coke | 7.50@8.00 |
| Pittsburgh lump | 4.75 | | |

### DETROIT, MICH.

Both steam and domestic consumers are showing much indifference in the matter of placing orders and the operators and shippers find business dull. There is little or no difficulty in getting shipments through from the mining districts, and buyers of steam fuel are taking advantage of this, and seem to think they will be able to pick up whatever fuel they require whenever they need it and at almost their own quotation; domestic coal users appear to be suffering no urgent need of replenishing their stock. Weather conditions during the week have been unusually mild. Operators and jobbers are looking forward to the opening of Lake navigation, which seems to be only about two weeks distant

The prevailing prices for today are as follows:

| | W.Va. Splint | Gas | Hocking | Cambridge | Ohio No. 8 | Pocahontas | Jackson Hill |
|---|---|---|---|---|---|---|---|
| Domestic lump | $1.40 | .... | $1.40 | .... | .... | $1.75 | $1.90 |
| Egg | 1.40 | .... | 1.40 | .... | .... | 1.75 | 1.90 |
| Nut | 1.30 | .... | 1.30 | .... | .... | .... | 1.50 |
| 1½-in. lump | 1.25 | .... | .... | .... | .... | .... | .... |
| ¾-in. lump | 1.10 | $1.10 | 1.10 | $1.10 | $1.10 | .... | .... |
| Mine-run | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 1.25 | .... |
| Slack | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 1.10 | .... |

**Anthracite**—Hard coal is coming in, in large quantities at present, and with the unusually mild weather, it is causing the market to be flooded with all sizes. The jobbers who have large supplies of independent coal on hand are disposing of it at from 25 to 50c. below circular. In a few instances demurrage has accrued on some of this fuel.

### MINNEAPOLIS—ST. PAUL

The general brizzard which has prevailed during the past week has been a very great relief to both wholesalers and retailers, and should cut a large hole in the stocks of coal on hand. Wholesalers are again hustling for new business, and beginning to agitate the storage question. Salesmen, who have been idle since the first of the year are again on the road, and while their orderbooks are not being filled very readily they are turning in some business.

Circulars for Apr. 1 are in the hands of the printers and the phrase "Subject to change without notice" will be prominently displayed. Anthracite at Lake Michigan and Superior points on Apr. 1 circulars, is quoted at $6.25 for egg and stove, $6.50 for chestnut, $5.25 for pea and $4 for buckwheat. It is expected with continued mild weather the opening of navigation will be early this year in which event large shipments will reach the docks during April and May.

Prices on all grades of Illinois coal are still unsteady and Franklin County, Harrisburg and Carterville coals can be bought for anywhere between $1 and $1.50 for prepared sizes at the mines. New River, lump and egg, from the East is

selling for $1.35 at the mines and Pocahontas can be had at the same price; mine-run is selling for as low as $1 at the mines.

### CHICAGO

There is a continued lack of activity in the Chicago coal market. No demand exists for domestic coal, retailers declining to increase their stocks lest they be compelled to carry a large part of them over into the summer. Domestic grades are not being produced by the mines except where it is necessary to do so in order to obtain fine sizes to apply upon contracts. Scarcely any orders are being received from the retailers for high-grade, southern Illinois coal. Operators in the Springfield district and producers of various Indiana coals are making no effort to sell their domestic product in Chicago. A number of them have changed their screens to make steam lump coal and others are disposing of what domestic they have at points nearer the mines.

The smokeless trade is unusually dull. Until the latter part of February, smokeless operators reported large sales at satisfactory prices. Business among dealers in anthracite continues to be slack. Prevailing prices in Chicago are:

| | Sullivan Co. | Springfield | Clinton | W. Va. |
|---|---|---|---|---|
| Domestic lump | $2.47 | $2.07 @ 2.22 | $2.27 | ..... |
| Egg | 2.47 | ..... | ..... | $3.95 |
| Steam lump | $2.12 @ 2.37 | 1.92 @ 1.97 | 2.17 | ..... |
| Mine-run | ..... | 1.87 @ 1.92 | 1.97 | 3.30 |
| Screenings | 1.67 @ 1.72 | 1.57 @ 1.62 | 1.67 | ..... |

Prevailing prices for coke are: Connellsville and Wise County, $5.75 @ 6; byproduct, egg, stove and nut, $5.50; gas house, $5.50.

### ST. LOUIS, MO.

A slight touch of winter, following an unusually pleasant spell of spring weather, brought about a slight demand for domestic coal in St. Louis the early part of the week, but it was of short duration and did not cause any change in prices.

Everything indicates that it will be a dragging market for the balance of the spring, and the operators are curtailing their tonnage, some of them having closed down.

There is considerable demurrage coal at diverting points, and it is usually sacrificed at prices far below the cost of production. The circular is:

| | Carterville and Franklin Co. | Big Muddy | Mt. Olive | Standard |
|---|---|---|---|---|
| 2-in. lump | ..... | ..... | ..... | $0.85 @ 0.90 |
| 3-in. lump | ..... | ..... | $1.25 | ..... |
| 6-in. lump | $1.20 @ 1.25 | ..... | 1.35 | 1.10 |
| Lump and egg | 1.25 | $2.25 | ..... | ..... |
| No. 1 nut | 1.10 @ 1.15 | ..... | ..... | ..... |
| Screenings | 0.90 @ 0.95 | ..... | ..... | 0.65 |
| Mine-run | 1.05 @ 1.15 | ..... | ..... | 0.85 |
| No. 1 washed nut | 1.40 @ 1.50 | ..... | ..... | ..... |
| No. 2 washed nut | 1.35 @ 1.45 | ..... | ..... | ..... |
| No. 3 washed nut | 1.25 @ 1.30 | ..... | ..... | ..... |
| No. 4 washed nut | 1.15 @ 1.20 | ..... | ..... | ..... |
| No. 5 washed nut | 1 00 @ 1.05 | ..... | ..... | ..... |

### OGDEN, UTAH

Coal shipments from Wyoming and Utah have dropped off in the past week and the mines in both states are experiencing idle days, due to lack of orders. This has decreased the production of slack and at present there is no appreciable surplus on the market.

Warm weather is prevailing generally over the territory west of the Mississippi River, and the demand for coal is decreasing. The over-production of nut coal continues, and there is quite a surplus of this grade at the mines drawing demurrage. Now that winter is practically over, and there is a diminishing call for lump, the mines will be compelled to decrease operation, and this will tend to keep down the surplus nut coal.

Conditions in Nebraska have not improved and it now develops that the Wyoming operators were unable to take care of the market during the fall and winter and the dealers were compelled to look elsewhere for coal. This gave the Colorado producers a chance to gain a foothold and as a consequence a portion of the spring and summer trade will go to them. This condition was caused by the car shortage during September, October and November.

May and June quotations for shipments to Nebraska have been announced as follows: Lump, $2.25; nut, $2; mine-run, $1.75; slack, $1. Quotations for the balance of the territory remain unchanged as follows: Wyoming Lump, $2.75; nut, $2.25; mine-run, $1.85 and slack, $1: Utah lump, $2.75; nut, $2.25; mine-run, $1.85 and slack, $1.25.

### PORTLAND, ORE.

The coal market here is quiet at this time, being between seasons. The demand is light and prices are unchanged, with no probability of any occurring until the summer rates go into effect. This will probably be in July as usual, when people begin to put in supplies on the strength of the reduction of $1 per ton for storage. So far there has been no indication of any Australian coal coming this way during the summer, although it is yet early, since chartering of carriers for the summer and fall business has not yet opened, excepting in some cases for lumber.

## PRODUCTION AND TRANSPORTATION STATISTICS

### COAL MOVEMENT

The following is a comparative summary of the coal movement in January of this year and last year as reported by seven of the largest railroads or districts in short tons except where otherwise noted:

| | 1913 | 1912 |
|---|---|---|
| Anthracite shipments (long tons) | 6,336,419 | 5,763,696 |
| Penn. R.R. (bituminous only)[1] | 5,498,710 | 4,522,296 |
| Baltimore & Ohio[2] | 3,442,580 | 2,443,528 |
| Norfolk & Western | 2,218,125 | 1,819,588 |
| Philadelphia & Reading[3] | 1,624,298 | 1,088,697 |
| Chesapeake & Ohio[4] | 1,295,043 | 1,337,216 |
| Virginian Ry | 453,886 | 317,405 |
| Total | 20,869,061 | 17,292,426 |

**Net Increase 20.7%**

[1]On lines east of Pittsburgh and Erie only. [2]Includes coke and that from affiliated lines. [3]Bituminous only. [4]Includes coke and anthracite.

**Note**—Tonnage included in this table covers nearly 40% of the country's production and the results may be taken as a fair criterion of the progress of business.

### CHESAPEAKE & OHIO RY.

The following is a comparative statement of the coal and coke traffic over the lines of the C. & O. Ry., for January, and the seven months ending Jan. 31, 1912-13, in short tons:

| | January | | Seven Months | |
|---|---|---|---|---|
| *Destination* | 1913 | 1912 | 1913 | 1912 |
| Tidewater | 377,520 | 335,290 | 2,068,111 | 2,305,754 |
| East | 303,493 | 212,524 | 1,518,698 | 1,282,149 |
| West | 489,985 | 749,893 | 5,437,455 | 6,485,458 |
| Total | 1,170,998 | 1,297,707 | 9,024,264 | 10,073,361 |
| Coke | 30,764 | 17,440 | 165,700 | 128,037 |
| *From Connections* | | | | |
| Bituminous | 92,894 | 18,914 | 334.565 | 136 240 |
| Anthracite | 378 | 3,155 | 7,349 | 21,904 |
| Grand total | 1,295,034 | 1,337,216 | 9,531,878 | 10,359,542 |

### NORFOLK & WESTERN RY.

The following is a statement of tonnages shipped over this road from mines in West Virginia and the commercial and company coal, for the month of February, in short tons:

| Field | Shipped | Tipple | Total | Commercial | Company |
|---|---|---|---|---|---|
| Pocahontas | 793,880 | 17,158 | 811,038 | 1,069,520 | 127,882 |
| Tug River | 192,545 | 3,809 | 196,354 | 158,212 | 38,142 |
| Thacker | 252,527 | 8,955 | 261,482 | 179,584 | 81,898 |
| Kenova | 64,018 | 9,173 | 73,191 | 61,491 | 11,700 |
| Clinch Valley | ..... | .... | ..... | 136,994 | 8,121 |
| | 1,302,970 | 39,095 | 1,342,065 | 1,605,801 | 267,743 |

Shipments of coke entirely from the Pocahontas field, were 121,058.

## FOREIGN MARKETS

### GREAT BRITAIN

**Feb. 28**—Large and small coals of all descriptions are scarce and values firm with an improving tendency. Today's quotations are approximately as follows:

| | | | |
|---|---|---|---|
| Best Welsh steam | $4.62@4.74 | Best Monmouthshires | $4.26@4.32 |
| Best seconds | 4.44@4.56 | Seconds | 3.14@4.20 |
| Seconds | 4.32@4.44 | Best Cardiff smalls | 3.72@3.84 |
| Best dry coals | 4.38@4.44 | Seconds | 3.60@3.72 |

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport; both exclusive of wrarfage, and for cash in 30 days—less 2½%.

### SPANISH IMPORTS

Imports of coal into Spain during 1912 amounted to 2,322,657 tons as compared with 2,055,466 for the year previous and 2,021,116 tons in 1911. Coke imports during the same periods were: 355,149 tons in 1912; 316,448 in 1911 and 294,158 tons in 1910.

### EGYPTIAN COAL IMPORTS IN 1912

Coal imports into Egypt for the year of 1912 were 1,638,417 tons, as compared with 1,581,619 in 1911.

# FINANCIAL DEPARTMENT

## Victor-American Fuel Co.

The following is a summary of the report of this company for the fiscal year ending June 30, 1912:

After providing for fixed charges and depreciation reserves, there remained a balance of $358,463 [against $510,688 in 1910-11]. Two dividends on the capital stock, aggregating $258,500, were paid. After making all adjustments, the credit balance in the profit and loss account, as of June 30, 1912, is $268,868 [as compared with $201,689 on June 30, 1911.]

The loss in earnings for the year was largely at the New Mexico mines, and due to a falling off in the tonnage of coal sold in Southern California and to increased cost from various temporary causes which have already been or will be removed. There is also a considerable loss as compared with the previous year in the falling off in the tonnage of coke sold. The Colorado mines, notwithstanding the halt in general business activity throughout the year, produced practically the same tonnage as the preceding year, with a slight increase in profits.

**RESULTS FOR YEARS ENDING JUNE 30**

| Short tons | 1911-12 | 1910-11 | 1909-10 |
|---|---|---|---|
| Coal produced | 2,228,448 | 2,256,041 | 2,358,909 |
| Coal sold | 2,069,361 | 2,033,699 | 2,063,085 |
| Coke produced | 54,600 | 84,943 | 108,409 |
| Coke sold | 52,625 | 85,213 | 108,693 |
| Coal purchased and sold | 6,459 | 103,353 | 206,833 |
| Gross earnings | $3,457,062 | $3,592,344 | $3,669,070 |
| Operating expenses | 2,805,471 | 2,788,625 | 2,832,720 |
| Net earnings | $651,591 | $803,719 | $836,350 |
| Total net income | $739,980 | $879,610 | $923,250 |
| **Deduct** | | | |
| Taxes | $30,339 | $21,597 | $20,152 |
| Insurance | 10,008 | 10,041 | 9,312 |
| Miscellaneous | 28,256 | 10,131 | 9,277 |
| Interest on V.-A. F. bonds | 127,325 | 126,000 | 152,500 |
| Interest on V. F. bonds | 92,350 | 93,550 | 95,000 |
| Depreciation | 103,238 | 107,603 | 116,580 |
| Dividends | (2¼%) 258,500 | (5) 470,000 | (3¼) 305,000 |
| Total deductions | $640,016 | $838,922 | $707,821 |
| Balance, surplus | $99,963 | $40,688 | $215,429 |

**BALANCE SHEET, JUNE 30**

| Assets | 1912 | 1911 |
|---|---|---|
| Real estate | $9,850,844 | $9,882,939 |
| Equipment | 2,691,530 | 2,620,147 |
| West. Stores Co. stk. | 210,000 | 210,000 |
| Col. & S. E. R.R. stk. | 100,000 | 100,000 |
| Col. & S. E. Ry. bds. | 300,000 | 300,000 |
| Mtn. Tel. Co. stk. | 15,000 | 15,000 |
| Bond redem. accts. | 71,067 | 21,251 |
| Development | 199,485 | 187,905 |
| Advance royalty | 42,928 | 43,671 |
| Supplies | 100,561 | 112,869 |
| Cash in banks | 131,977 | 124,151 |
| Accounts and bills receivable | 390,900 | 356,030 |
| Treasury bonds (V.-A. F. Co.) | 53,000 | ..... |
| Coal and coke on hand | 14,314 | 5,849 |
| Miscellaneous | 10,227 | 7,094 |
| Total | 14,181,833 | 13,986,906 |
| **Liabilities** | | |
| Capital stock | $9,400,000 | $9,400,000 |
| 1st and ref. M. 6s | 2,153,000 | 2,100,000 |
| Victor Fuel Co. bonds | 1,847,000 | 1,871,000 |
| Interest accrued | 100,900 | 99,534 |
| Bills payable | 107,900 | 2,000 |
| Voucher and pay-rolls | 161,163 | 168,211 |
| Taxes accrued unpaid | 10,350 | 10,600 |
| Unpaid coupons | 505 | 950 |
| Net liability to sub cos. on current account | 50,875 | 104,439 |
| Res. for bond redem. | 70,781 | 21,044 |
| Disc. on V. F. Co. bonds redeemed | 10,445 | 7,439 |
| Acc'n for bond red. | 44 | ..... |
| Profit and loss | *x*268,869 | 201,689 |
| Total | 14,181,833 | 13,986,906 |

*x* After deducting losses of $33,743 through Weaver mine fire and $1519 miscellaneous and adding misc. credits of $2478.

**INCOME ACCOUNT**

| Net revenues: | 1912 | 1911 | 1910 | 1909 |
|---|---|---|---|---|
| Railroads | $2,288,899 | $2,287,147 | $2,285,253 | $2,278,055 |
| Canals | *12,916 | 32,898 | 22,264 | *18,904 |
| Coal | 1,579,310 | 2,033,357 | 1,698,276 | 1,227,656 |
| Miscellaneous | 354,587 | 191,391 | 138,728 | 167,737 |
| Total net | 4,209,880 | 4,534,793 | 4,144,521 | 3,654,543 |
| **Deductions:** | | | | |
| General expense | $139,841 | $146,451 | $151,988 | $137,239 |
| Taxes | 450,567 | 432,610 | 368,078 | 292,363 |
| Interest | 931,215 | 861,362 | 897,343 | 884,719 |
| Rentals | ..... | ..... | ..... | ..... |
| Sinking fund | ..... | ..... | 183,068 | 152,686 |
| Depreciation | 400,000 | 385,000 | 300,000 | 300,000 |
| Total deduct | 1,921,623 | 1,825,423 | 1,900,477 | 1,767,007 |
| Surplus | †2,288,256 | 2,709,370 | 2,244,044 | 1,887,536 |
| Prev. surp. | 1,514,771 | 1,010,605 | 748,203 | 4,294,163 |
| Sdy. adj. dr. | 22,926 | 177,007 | 49,897 | 469,108 |
| Scrip div. 15% | ..... | ..... | ..... | 3,150,412 |
| Dividends | 2,124,636 | 2,028,196 | 1,931,744 | 1,813,976 |
| P & L surplus | 1,655,466 | 1,514,771 | 1,010,605 | 748,203 |

*Deficit.

†Equal to 8.61% earned on $26,557,950 capital stock after allowance for depreciation, compared with 10.2% earned on same stock previous year.

## COAL SECURITIES

The following table gives the range of various active coal securities and dividends paid during the week ending March 15:

| Stocks | Week's Range High | Week's Range Low | Week's Range Last | Year's Range High | Year's Range Low |
|---|---|---|---|---|---|
| American Coal Products | 88 | 88 | 88 | 88 | 87 |
| American Coal Products Pref. | 101 | 101 | 109½ | 109½ | 109½ |
| Colorado Fuel & Iron | 34 | 32 | 33½ | 41½ | 31 |
| Colorado Fuel & Iron Pref. | .... | .... | 155 | 155 | 150 |
| Consolidation Coal of Maryland | 102½ | 102½ | 102½ | 102½ | 102½ |
| Island Creek Coal Pref. | 86 | 85 | 85 | .... | .... |
| Lehigh Valley Coal Sales | 240 | 204 | 204 | .... | .... |
| Pittsburgh Coal | 21½ | 19¾ | 20 | 24¾ | 22 |
| Pittsburgh Coal Pref. | 85 | 82 | 84 | 95 | 82 |
| Pond Creek | 23 | 22½ | 23 | 28½ | 22 |
| Reading | 157½ | 152½ | 156¾ | 168¾ | 152½ |
| Reading 1st Pref. | 90½ | 90 | 90½ | 91½ | 89½ |
| Reading 2nd Pref. | .... | .... | 90 | 93 | 87¾ |
| Virginia Iron, Coal & Coke | 50 | 48 | 50 | 54 | 44¼ |

| Bonds | Closing Bid | Closing Asked | Week's Range or Last Sale | | Year's Range | |
|---|---|---|---|---|---|---|
| Colo. F. & I. gen. s.f.g 5s | 98 | 99 | 98 | 98 | 98 | 99½ |
| Colo. F. & I. gen. 6s | .... | .... | 107½ | June '12 | .... | .... |
| Col. Ind. 1st & coll. 5s. gu. | 78½ | Sale | 78½ | 81 | 78½ | 85 |
| Cons. Ind. Coal Me. 1st 5s | .... | 80 | 85 | June '11 | .... | .... |
| Cons. Coal 1st and ref. 5s | .... | 94 | 93 | Oct. '12 | .... | .... |
| Gr. Riv. Coal & C. 1st g 6s | 96 | 102½ | 102½ | Apr. '06 | .... | .... |
| K. & H. C. & C. 1st s f g 5s | .... | .... | 98 | Jan. '13 | 98 | 98 |
| Pocah. Con. Coll. 1st s f 5s | 87½ | 87¾ | 87¾ | 87¾ | 87½ | 87¾ |
| St. L. Rky. Mt. & Pac. 1st 5s | 75 | 77½ | 76½ | Feb. '13 | 76½ | 80 |
| Tenn. Coal gen. 5s | 100 | 102 | 100½ | 100½ | 100½ | 103 |
| Birm. Div. 1st consol. 6s | 101½ | 102¾ | 101½ | 101½ | 101½ | 103 |
| Tenn. Div. 1st g 6s | 101 | 103¾ | 102 | Feb. '13 | 102 | 102 |
| Cah. C. M. Co. 1st g 6s | .... | .... | 110 | Jan. '09 | .... | .... |
| Utah Fuel 1st g 5s | .... | .... | .... | .... | .... | .... |
| Victor Fuel 1st s f 5s | .... | 84 | 79½ | Feb. '13 | 79½ | 79½ |
| Va. I. Coal & Coke 1st g 5s | 95 | 97½ | 95½ | 95½ | 95½ | 98 |

**Ashland Coal & Iron Co.**—Dividend of 1% payable Mar. 20 to holders of record Mar. 19.

**American Coal Products Co.**—Dividend of 1¾% on the common, payable Mar. 31.

**Island Creek Coal Co.**—Dividend of 50c. on the common, payable May 1 to holders of record Apr. 26. Dividend on preferred of $1.50 payable Apr. 1 to holders of record Mar. 25.

**Burns Bros.**—This concern was recently consolidated with the Curtis-Blaisdell Co., forming the largest retail coal company in the world. The new company is a New Jersey corporation, and will have $2,000,000 7% cumulative preferred and $5,500,000 common stock.

**Reading Coal & Iron Co.**—It is popularly believed that the anthracite companies are working on a basis that produces an enormous profit for them. As a matter of fact, the companies are working on a remarkably narrow margin of profit, and one which has been gradually contracting during recent years. Thus, in 1903, the Reading company showed earnings at the rate of 53c. per ton of coal mined; in 1908, this had fallen to 32c. per ton, and for 1911 it amounted to only 15c. per ton.

**Monongahela River Consolidated Coal & Coke Co.**—This company was incorporated in Pennsylvania, in June, 1899, to consolidate coal interests along the Monongahela River, and coal traffic to New Orleans, etc., including 200 steamers and 4000 canal boats, barges, coal elevators, etc. In September, 1903, the Pittsburg Coal Co. purchased $15,000,000 of the $20,000,000 common and $2,500,000 of the $10,000,000 preferred stock at $15 and $45 per $50 share, respectively.